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# The Dental Digest

February 1930

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# THE DENTAL DIGEST

VOLUME XXXVI

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### THE DENTAL DIGEST

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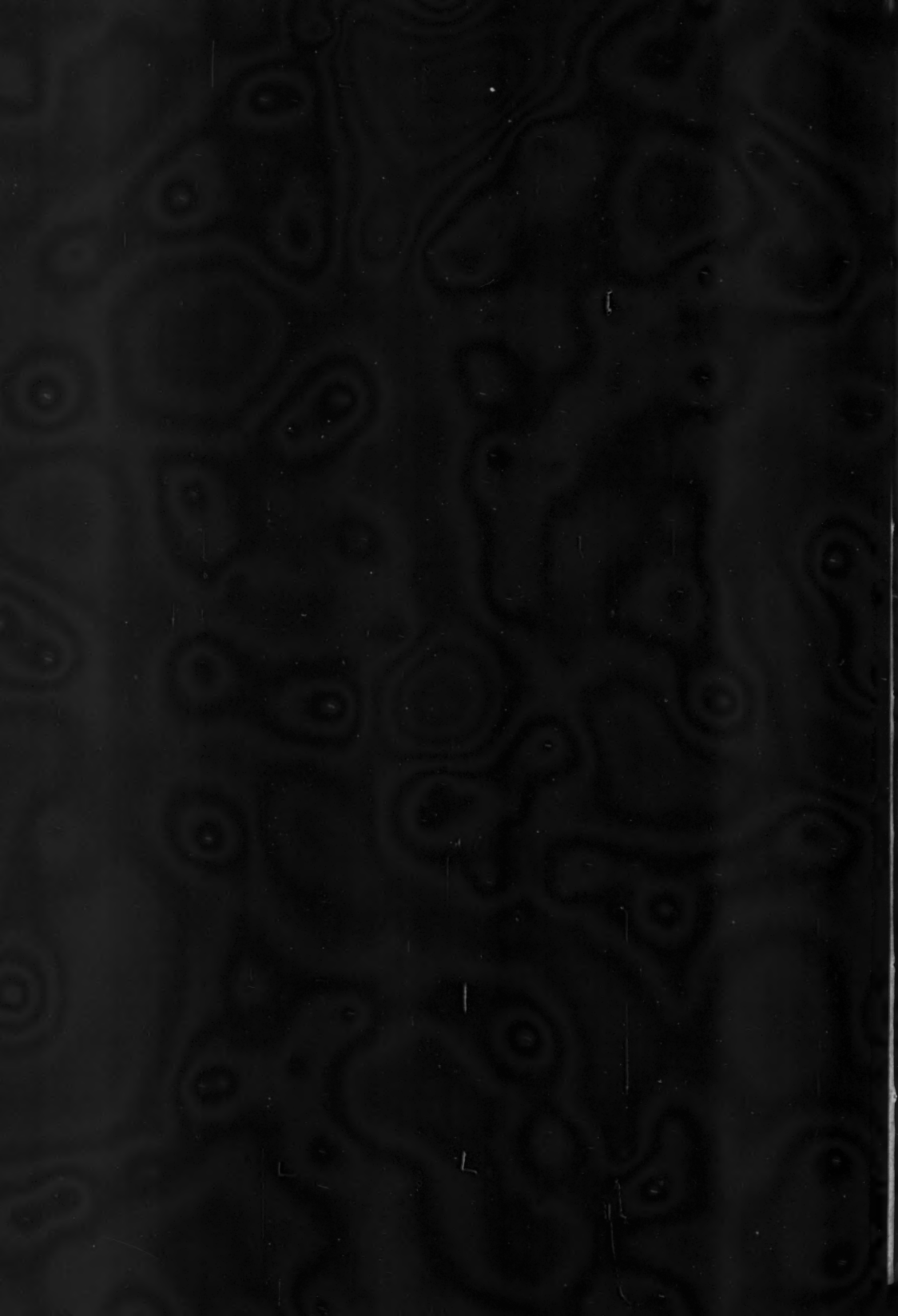
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# THE DENTAL DIGEST

VOLUME XXXVI

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## A Consideration of Some Surgical Conditions of the Mouth Within the Scope of Practice of the General Practitioner\*

By M. HILLEL FELDMAN, D.D.S., New York, N. Y.

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In appearing before you with a paper dealing with some of the surgical conditions of the mouth with which you make frequent professional contacts I feel that I must confine myself to the ultimate essentials. It would be manifestly too ambitious an effort on my part were I to try to touch ever so lightly upon even a minor share of the many conditions which come within the field of dental pathology. Voluminous textbooks on the diseases and the malformations of the mouth are at your disposal in the medical and dental libraries. Even in these major efforts the authors have here and there fallen short of the supreme task.

I feel, then, that in giving you a bare outline of surgical conditions of the mouth within the scope of practice of the general practitioner I am guided by the thought that it is well not to stress too much, lest you fail to take away with you some really valuable aids to every-day practice.

With this in mind I have outlined my address this evening to embrace the following subjects:

- (1) Soft tissue dissections.
- (2) Soft tissue sections.
- (3) Diseases and surgery of the pericementum and of the periosteum.
- (4) Diseases and surgery of the mucosa.
- (5) Diseases and surgery of the roots of teeth.
- (6) Swellings about the face of non-dental nature.

In elaborating the outline I shall concern myself with the factors which feature the clinical aspects as they suggest the diagnosis and the surgical procedures involved.

### SOFT TISSUE DISSECTIONS

From a somewhat extensive contact with general dental practitioners I have made the observation that many of your difficulties could be eliminated if you were to acquaint yourselves with the principles and practice of dissecting soft tissue from the maxillary and mandibular structures.

I favor the utilization of the cadaver for achieving the confidence that you must possess in order to acquire elementary surgical skill. Surgical familiarity

\* Read before the Westchester Dental Society, Yonkers, N. Y., December 17, 1929.

with the cadaver is part of the training of the medical student, both undergraduate and graduate. The medical surgeon would not think of performing an appendectomy without previously performing many similar operations in the dissecting rooms. Thus far the dental student has made himself familiar only with the dissecting procedures that are necessary to give him the anatomic landmarks of the human body. The teaching curriculum of the dental schools in this country does not go beyond this phase of dissection. I feel that in making this suggestion I am presenting constructive criticism for the betterment of undergraduate teaching of dentistry in the surgical division. The dissecting room must precede the operating room for the dental undergraduate if the dental practitioner is to become at all familiar with elementary surgical technic.

When I speak of soft tissues, I mean the mucous membrane and the periosteum. For surgical purposes these two tissues are jointly referred to as the mucoperiosteum. They must be so considered by you, because one should not be lifted from the bone without the other.

The mucoperiosteum is reflected from the bone for two reasons:

- (1) For the avoidance of injury to the mucoperiosteum, in order to facilitate and favor the healthy healing of wounds.

- (2) For the protection which this step affords to bone surfaces that would cause pain and slough if deprived of the osteogenetic function of the periosteum.

*The indications for the operation of*

*dissecting the mucoperiosteum from the bone are as follows:*

- (1) Before the application of forceps' beaks in order to avoid the tearing and splitting of the mucoperiosteum during exodontic procedures. This step will avoid the deep lacerations to the edentulous areas. As a result, the wound will not present unsightly esthetic features, and conservative, early prosthesis will be facilitated. The mucoperiosteum is frequently very adherent to the labial and buccal alveolar tissue. The alveolar tissue, by virtue of an unyielding pericementum, possibly due to calcification of the tissue, in turn may be intensely resistant to the delivery of the tooth. The result may be a tooth freed from its alveolus, carrying on its labial or buccal aspect of the root a portion of alveolar tissue, with or without the periosteum alone or the mucoperiosteum. I do not advocate the general dissection of the mucoperiosteum from the bone as a preliminary to the application of the beaks of the forceps to the teeth which you are to extract. But I do feel that many cases present themselves to you which indicate that there may be difficulty encountered in the effort to deliver the tooth upon which you are operating. Such teeth are the roots which have been prepared for the reception of dowel crowns. Many of these teeth are subject to fracture during delivery. The preparatory reflection of the labial mucoperiosteum will avoid the laceration in the incisor region, where esthetic considerations are so important a factor in prosthesis. The operator who finds that initial application of the forceps' beaks has failed to deliver the root



reapplies the beaks for deeper purchase, and, as the merry process goes on, he finds that the closely adherent labial mucoperiosteum does not stand politely by. There is usually a most unwelcome scarification of tissues. A soft tissue dissection, as outlined later, lays open the operative field and permits you to carry out the necessary surgical relief in a conservative manner. To some of you, perhaps, this step seems radical. I feel that it is well to be radical if a certain operative technic yields conservative results. The replacement of the mucoperiosteum and its coaptation to its original points of tissue contact will be taken up shortly. Here I wish to point out that there is absolute freedom from unsightly post-operative results.

(2) The mucoperiosteum is reflected from its bony attachment before the secondary procedure for the recovery of deep root fractures which require an approach by way of the buccal alveolar wall. The principles of sound surgery dictate this technic for your favorable consideration. I know there are those who will come forward to dispute my proposal. Some of you will advance the claim that you have had good results without resorting to the making of a mucoperiosteal dissection. There is more than one road to Rome; I prefer to take the road which has been macadamized. I may compare the intra-alveolar method of delivering a deep root fracture to a rocky, shell-punctured path. In practicing a soft tissue dissection preparatory to exodontic procedures we are availing ourselves of the accepted principles of general surgery.

In using the intra-alveolar avenue

for the delivery of a root fracture you are frequently leaving undetected at the moment sharp labial alveolar margins. This is an indisputable fact. If you lay back the mucoperiosteum from the labial alveolar wall and complete the root delivery, you will notice the jagged alveolar margins that require trimming down. These areas would escape notice in large measure at the time of operation and make themselves felt only during the healing stage. They then call for surgical relief, the technic for which will be outlined to you presently.

(3) The mucoperiosteum is dissected from the labial alveolar wall as the preliminary step in the operation of root-end resection or apicoectomy, or root amputation, or root section. A wide exposure of the operative field is essential for conservative surgery. The technic of some operators who still adhere to the old custom of penetrating the labial soft tissues to the bone with a bur in the engine is open to question on the score of injudicious surgery.

(4) The mucoperiosteum is dissected from the labial alveolar wall in exposing the operative field in alveolectomy technic.

Alveolectomy is resorted to for the purpose of obtaining:

- (a) Better ridge contours.
- (b) Relief of buccal alveolar overhang and undercuts.
- (c) Relief from the annoyance caused by sharp, spiny processes remaining after extractions.
- (d) The removal of bony excrescences or exostoses such as occur on the lingual aspect of the premolar region of the mandible.

The principles of scientific prosthesis demand that the ridge contours be such that the seating of the denture be level on both sides of the arch. There should be, as far as possible, no unilateral dipping down of the ridge. Again, the prosthodontist will tell you that a large source of your troubles in seating dentures may be attributed to the absence of a rounded ridge outline and to the presence, in its stead, of a sharp, thin, bony ridge. Such a condition not only interferes with the desired prosthetic requirements, but also gives rise to pains which are frequently obscure and baffling to the operator.

If a buccal alveolar overhang, such as one sees about cuspid and molar edentulous areas, is permitted to remain without surgical relief, satisfactory prosthesis is out of the question. On the one hand, there is pain during the insertion and removal of the denture. On the other hand, there is loss of the necessary deep labial and buccal adaptation of the denture, which follows the removal of the offending denture material. It would be far better for your patient if you removed the bone labially and buccally before taking an impression of the mouth for the reception of the denture. You will thus eliminate the pain and retain for your appliance the most desirable deep tissue adaptation for better retention.

Bony excrescences or exostoses occur chiefly in the palate, in the median line and in the mandible, on the lingual surface of the premolar region. I do not favor surgical interference with the palatal exostoses, but the mandibular bony prominences should be removed because they frequently interfere with proper seating of the denture.

(5) The mucoperiosteum is dissected from the bone in the operation for the delivery of an unerupted or an impacted tooth. The comparative infrequency of the intrusion of impacted teeth upon the attention of the average general practitioner of dentistry does not favor the development and acquisition of efficient technic. With few exceptions, general practitioners had best refer this type of surgery to one better versed in the procedure.

You will note that I am trying to confine my discussion of surgical conditions to those with which I believe the average general dental practitioner ought to become more familiar, should he be so inclined. Impacted teeth really come under a classification of advanced surgery. I would urge upon you the exercise of the greatest caution in the handling of impacted teeth. I frequently come in contact with cases where the ambitious operator has plunged his forceps into a small aperture made by a portion of an erupting mandibular third molar. All that he has succeeded in achieving is the cracking off of a particle of the enamel, to say nothing of the soft tissue laceration. If only the operator has made a mucoperiosteal dissection, he would have displayed at least the possession of the prime essential to successful impaction surgery.

(6) The mucoperiosteum is dissected from the bone in the operation for surgical relief of periodontal pathology—the so-called *pyorrhea operation*. The relief of these conditions through subgingival scaling and curetting is perhaps favored by the majority of practitioners of the specialty of periodontia. That there are some indi-

cations for surgical technic, even the most orthodox of the advocates of instrumentation will concede.

(7) The mucoperiosteum is dissected from the bone in exposing the operative field in cystectomy. Surely it must be evident to you that if you want to see the extent of the involvement of the cystic area, you must have an open view of the field. The possible encroachment of the cyst upon the roots of the teeth which bound the cavity may thus be definitely determined. Teeth which might be condemned from a pre-operative x-ray reading are frequently given a clean bill of health when the mucoperiosteal dissection exposes the entire field to direct inspection and palpation by the operator.

In the second section of this paper, which I now take up, I shall discuss matters of operative technic. Having thus briefly sketched the surgical indications with which you are definitely and vitally concerned, I am now prepared to give you some of the elementary principles essential for their relief.

*The technic for the reflection of mucoperiosteal tissue from bone follows:*

(1) Lifting or elevating the mucoperiosteum without incisions. In this operation the instrument known as the periosteal elevator is brought into play. The elevator blade must not be too sharp. A knife-edged elevator will scratch the bone, and this may be conducive of post-operative discomfort, hence the rounded end is to be preferred. The grasp of the instrument should be such as to give the greatest degree of control and guidance of the blade. By applying the fingers as close as possible, or convenient, to the cut-

ting end of the blade, this will be achieved.

The periosteal blade is now applied to the buccal gingival crevice at the cemento-enamel junction, and the mucoperiosteum lifted away from the hard tissues (Fig. 1). The extent of the operative area will govern the amount of tissue elevation. The elevation should be from one-eighth to one-quarter of an inch, measuring from the gingival border toward the apex



Fig. 1

Technic for the reflection of the mucoperiosteum without incision. The periosteal blade is introduced into the gingival crevice, and the soft tissue lifted carefully from the bone.

of the tooth. When the mucoperiosteum is very tensely adherent to the labial hard tissues, the preparatory elevation thus carried out will prevent laceration and permit easy forceps engagement of the tooth.

(2) Elevation of the mucoperiosteum after previous incision. The technic of elevation of the mucoperiosteum by means of a previous incision is resorted to more frequently. You must realize that it is not possible to elevate

the mucoperiosteal tissue to any extent with the periosteal blade alone, as you will split the tightly drawn tissue. That step certainly has its limitations. If drill or mallet force is to be employed for the delivery of roots deeply embedded, the reflection of the soft tissues labially or buccally must be effected by means of the knife and periosteal blade.

The knife that I use and unhesitatingly recommend is the Williger knife.

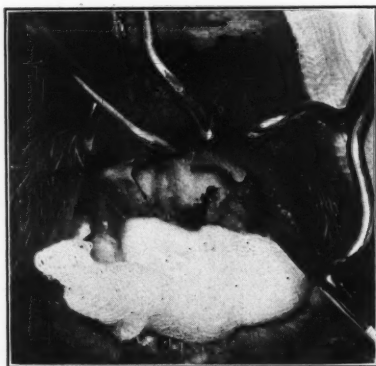


Fig. 2

Following elevation of the mucoperiosteum after incision. Lateral incision of the soft tissue before lifting the mucoperiosteum from the bone prevents tearing of tissue.

This type of blade is ideally suited for the operation of soft tissue dissection. The knife edge is directed against the mucoperiosteum and pressed against the bone. If the blade is kept sharp, practically no pressure is necessary to effect an incision. The blade must cut down to the bone. The line of incision is an important consideration. If the lateral osseous boundaries of the area of operation are directly subjacent to the lines of tissue section, there will

be a sagging inward of the severed tissue when it is later coapted. I make my lines of incision at an angle, widening out and away from the operative bone area. Sometimes a single-line incision suffices. This is especially true when I operate upon the mandibular third molar. Usually, however, a double-line incision is necessary in order to expose the area of operation sufficiently. You should not hesitate to reflect the mucoperiosteum rather deep when you expect to encounter considerable apical difficulty to tooth delivery. If you are careful as regards asepsis, there is no damage done to the tissues. Usually there is no pain following this technic.

In making an incision for apicoectomy the blade is drawn horizontally across the labial aspect of the mucoperiosteum. This incision should extend at least half-way across the lateral dimensions of the adjacent teeth on both sides. Its distance from the gingival border of the tooth depends upon the extent of the diseased area from the apex of the tooth downward to the gingiva. The next step is to make two lateral incisions to join the horizontal incision. The lateral incisions completed, the periosteal elevator is applied to the horizontal incision and the tissue lifted away apically (Fig. 2). If the incisions have been correctly made, that is, if the mucoperiosteum has been severed directly to the bone, there will be no tearing at this stage of the technic. If there is excessive bleeding while lifting the soft tissues away from the bone, the frequent sponging of the area with normal saline will check it.

For more extensive surgery, such as an alveolectomy, the soft tissue is dis-



sected from the bone at the gingival borders of the teeth, if any are present, or from the center of the ridge if the area is already edentulous. Too much bone may be removed in an overambitious operation. It is necessary to bear in mind the prosthetic requirements. If it is at all possible to say so with any degree of certainty, the distance which you are to remove bone labially should be about one-third of the area from the ridge apically. This would not apply to the alvelectomies of advanced type where there is a hyperplastic condition present.

In the usual case where you wish to remove bone tissue to hasten the resorptive process of the soft alveolar bone, you must study the case before removing any bone at all. The septal tissue is removed, and also the labial plate, for about one-third the distance toward the apex. The instruments I use for this operation are the rongeur forceps, the curet, and mounted stones in the engine. Some operators may find greater success with bone files than has been my experience. To date I must confess that bone files are a failure in my hands.

When you are operating upon a maxillary molar area, be careful not to leave buccal prominences, which, in effect, create painful undercuts. These are a continuous source of irritation when dentures are seated.

In extracting mandibular molars it is necessary to note the buccal gingival alveolar border. In most cases this portion of the alveolus is loosened during the exit of the tooth, due to the constriction of the bone at the cervix of the tooth. My technic is to introduce a curet to remove these loosened bone

fragments. The index finger of the left hand is your guide as to when to discontinue curetting. Pass your finger along the buccal mucous membrane and note whether you experience any sharp points underneath.

Irrigation of the alveoli with hot normal saline to remove bone spicules is the next step.

*The technic for the replacement of mucoperiosteal tissues to the point or points of original attachment is as follows:*

There are two means at hand for the replacement of severed tissues. The first is that of union by coaptation without the aid of sutures, permitting the flap tissue to rest against a vaselined gauze dressing, which acts as a wound matrix. The second means is that of union by coaptation of the severed parts with the assistance of sutures for retention until the organization of a blood clot forms the basis for permanent reattachment.

(1) *Union without suture.* Whether a mucoperiosteal flap requires suture retention depends upon your observations (1) as to whether the play of the lips, cheeks or tongue seems to cause a sagging of the tissue, and (2) as to whether the tissue sags away from the point of separation when you replace it. If there is easy coaptation, the next step is to introduce a vaselined gauze dressing into the alveolus and compress the tissue against the dressing. Keep the line of incision clear of foreign matter, such as gauze, vaseline or medicament, if you wish to assure successful coaptation. The patient is now requested to wait for ten minutes with the wound so dressed. If inspection at this time detects no separation of the

tissues, it is reasonable to expect that sutures will be unnecessary. The dressing is removed in twenty-four hours. Union of the severed parts takes place in this time.

(2) *Union with suture.* The suturing of tissues is a simple matter. My only aim in avoiding this step is to make things more simple, wherever I can, for myself, for my patient and for you.

The instruments and materials I use



Fig. 3

Replacements of the mucoperiosteum elevated in the previous operation, as shown in Fig. 2, after the bone-trimming for the removal of rough margins has been performed.

in this operation are curved hemostatic forceps for holding the needle, one-inch curved suture needles, and black silk, No. 8 fine.

You may purchase the needles already threaded and kept in sealed glass containers or you may thread your own needles, wind them around a gauze sponge and keep them in a small bag, which you use as a wrapping for sterilizing in your autoclave. This is the method I use personally.



Fig. 4

The engagement of the detached mucoperiosteum by the suture needle in the first step of the reattachment of the soft tissue.



Fig. 5

The next step in the technic of suturing, showing the needle passing through the second point of attachment for the coaptation of the severed parts.



Fig. 6

The completion of the replacement of the reflected mucoperiosteum with sutures. This photograph shows also the lines of incision, which should always be at an oblique angle.

The needle forceps should grasp the needle near the threaded portion. The first insertion of the needle is in the loose flap tissue. The needle is drawn through this mucoperiosteum and into the main tissue. The points of insertion of the needle must be predetermined. You replace the tissues at the outset and note at what points the needle must pass in order to effect perfect coaptation.

For tissues in simple separation, that is, where only one incision has been made, a single well-placed suture is usually sufficient. For tissues in double separation, at least two sutures must be employed.

Frequently it may happen that some of the mucoperiosteum has been lost during the operation. In replacing the

flap there may be loss of contact at the lateral boundaries. Do not try to draw the tissues together with sutures in the hope that you can effect successful coaptation by tension. Not only will there be pain following this technic as a result of strangulation, but you will meet with failure in your efforts at reattachment. In such cases there must be healing by granulation, or secondary union, as opposed to the primary union which ensues when severed mucous membrane surfaces are in correct relationship. Always be careful that the severed tissues do not overlap nor turn in when coapted. Union can take place properly only when there is an apposition of the severed surfaces and not of the smooth mucous membrane surfaces.

#### SOFT TISSUE SECTIONS

Under this heading I wish to discuss briefly some of the more common conditions which confront the general practitioner. These are:

- (1) The soft-tissue folds which result from ill-fitting dentures.
- (2) Hypertrophic gingivitis.
- (3) Loose mucosa on the ridge, giving, in effect, a rocking seat for dentures.
- (4) The sectioning of muscle attachments that do not permit denture adaptation to labial and buccal alveolar plates.

*Loose soft-tissue folds* develop, as a rule, on the labial and buccal aspects of the dental arches. Their sectioning is a simple procedure. Dissect the loose tissue from the tissues beneath until you obtain a surface which approximates the level of the rest of the structures. It is not necessary to cut down

to the periosteum. Healing takes place promptly by granulation. No suturing is necessary. Should there be persistent oozing, compress the point of hemorrhage with a hemostat for a moment and then relax the pressure.

*Hypertrophic gingivitis* may or may not be associated with periodontoclasia. Aside from those conditions affecting women during pregnancy and lactation (and these are left alone), there are frequent occasions for your surgical interference. The subgingival pockets are not, as a rule, very deep.

The dissection of the labial tissues thus affected, the cleansing of the bone and tooth surfaces underneath, the sectioning of the hypertrophied tissue, and the replacement by suture coaptation of the dissected mucoperiosteum constitute the steps in this operation. You should also correct malocclusion wherever you detect it. When large areas are involved, make the correction in several operations, including from three to six teeth at one sitting. Sometimes you may be able to perform this operation without incision for mucoperiosteal elevation. The periosteal elevator insinuated into the gingival crevices may permit you to obtain a reflection from tooth and bone surfaces sufficient for inspection and curettage of the area of degeneration. If incisions are necessary, the lines of incision are made obliquely, as described early in this paper.

Very fine curets and scalars are used for removing the degenerated tissue in the interdental spaces and necrotic alveolar surfaces. Before the replacement of the reflected mucoperiosteum the jagged alveolar tissue is smoothed with fine curets. Sponge well with hot

normal saline. Then section off the enlarged portion of the mucoperiosteal flap so that you have an even line of healthy tissue. On the lingual or palatal aspect similar surgery is carried out and then the severed tissues are coapted with sutures through each individual interproximal space. Primary union of tissues ensues.

*Loose ridge mucosa* is found frequently. When there is considerable bone loss associated with the removal of teeth, there is insufficient resorption of the mucosa at the ridge. This tissue remains as a distinctly loose, movable area. To remove it, make an incision along the ridge for the entire extent of the tissue to be sectioned. Carry your blade down to the osseous ridge underneath. Then section off a strip of tissue labially and lingually to such an extent as to assure you of closely approximating, tense lips of the wound. Frequent trial coaptation of the two tissues may be necessary before you decide that you are ready for suture adjustment.

*Muscle attachments* often interfere with the proper seating of dentures. To section these tissues, it is necessary to cut away the fibrous attachment from the ridge surfaces and to reattach the tissue higher with sutures. This is a simple operation well within the scope of the practice of the general practitioner who desires to do this work.

#### DISEASES OF THE PERICEMENTUM AND THE PERIOSTEUM

Inflammation of the pericementum may be induced by gangrenous pulp decomposition, the introduction of bacteria through instrumentation or the imperfections of restorations, or the infection of the apical space by some



contiguous abscess or inflammatory process such as frequently occurs when maxillary molars are in close anatomic relationship to a septic maxillary sinusitis.

The treatment for the relief of acute, non-suppurative pericementitis consists of the removal of the irritating factor. In the severe cases, with acute suppurative development, where there is no immediate relief through incisions, the removal of the affected tooth is necessary.

Chronic pericementitis may be proliferative or suppurative. Chronic proliferative pericementitis may be either apical or parietal, that is, along the pericemental wall between the gingival crevice and the apex of the root.

It is well to remember that a tooth may have a proliferation of the pericemental tissue at the apex and yet respond to a vitality test of the pulp. The question of the retention of the tooth must depend upon the amount of loss of the bony investment. Where half or more of the length of the root is denuded, I would not favor the retention of the affected tooth. Certainly teeth showing x-ray evidence of chronic proliferative pericementitis at or near the root apex should be removed.

Teeth showing parietal proliferative pericementitis may be retained for some time by means of the operation of reflecting the mucoperiosteum and curetting all hypertrophied and diseased tissue.

Chronic parietal proliferative pericementitis associated with suppuration spells an unfavorable prognosis for the tooth or teeth so affected. The removal of such teeth is best. An excellent temporizing measure for the relief of sup-

purative pericemental tissues which develop localized swellings due to interference with drainage is to puncture the abscess with the cautery. This will cause the evacuation of pus without the hemorrhage caused by the scalpel.

The periosteum may be injured in many ways. For the purposes of this paper I wish to discuss here the phase of periostitis that is associated with hypodermic-needle technic.

The injecting needle should not be directed under the periosteum when introducing the anesthetic solution. All infiltration procedures should be confined to the areolar tissues in the mucobuccal folds. No soreness results from infiltration, when properly induced. There is always irritation of varying degrees of progressive inflammatory change when the hypodermic needle and the anesthetic solution pass under the periosteum. X-ray examination is negative in the early stages of periostitis, regardless of the severity of the clinical symptoms. Later you may see a bulging in the bone contours produced by the inflammatory exudates depositing themselves between the bone and the periosteum. Incision for drainage and free evacuation of the area is the procedure if hot local applications to the part intra-orally fail to afford relief. Cold compresses on the face should not be employed too long. One day is sufficient. If this fails to abort the abscess formation, heat and incision, or heat alone, as indicated by the particular case developments, should be employed. Do not hesitate to apply warm wet dressings on the face. Frequently the warm dressing causes early non-surgical resolution. Epsom salts, boric acid or lead acetate is used on the

dressing, directly over which a hot-water bag is placed.

#### DISEASES OF THE MUCOSA

One of the most frequent contacts you make is that of pericoronitis. This is especially typical of painful retarded mandibular third molar dentition. Cuspid teeth are only occasional offenders. At any rate, cuspid teeth do not create the havoc that mandibular third molars so often do.

The symptoms may vary from a mild gingivitis to a very severe involvement of the submaxillary glands, tonsillar infection and systemic poisoning with fatal termination. The treatment consists, first, in reducing the acute symptoms. This is done by irrigation of the part with hot normal saline. A good method which you may adopt is the one I use. A curved glass medicine dropper is directed to the area of inflammation. The dropper is connected to a rubber tubing carrying the saline solution from an enamel irrigating can or an ordinary rubber fountain syringe. Paint the part with a 1% solution of acriviolet kept in tissue contact for one minute. Cold compresses externally are tried for twenty-four hours. If this does not give relief in the time mentioned, change to hot boric acid or magnesium sulphate externally in the submaxillary area. The patient's resistance should be kept high by strict attention to all the metabolic functions. An alkalin drinking water, three quarts a day, makes an excellent internal agent for the alkalinization of the body.

When the acute stage has subsided, the offending third molar should be removed. I do not find any justification for the technic of cutting away the

occlusal soft mucosa and permitting the tooth to remain. Once you understand exactly what you are confronted with here, you cannot fail to agree with me. These teeth are usually crowded against the ramus. Their full eruption is impossible in these instances. My rule is as follows:

Unless all of the enamel of a tooth can stand in the arch entirely free of hard and soft tissue investment, extract the tooth. The removal of the occlusal flap is not conducive to full eruption. The pocket still exists posteriorly where the crown is crowded against the ramus. If you will examine the x-ray negative, you will find that the bone space between the second and the third molars is much less than that between any two other teeth on the same side. In fact, the distal root of the second molar is frequently very closely related to the mesial root of the third molar. I frequently remove such third molars which have at some previous time occasioned quite severe symptoms and have been treated with the so-called conservative means of occlusal flap section.

I cannot go at length into a discussion of gingivitis. I shall confine myself to the gingivitis which is associated with periodontoclasia, and that which is known most generally as "trench mouth." In the former, thorough prophylaxis, removal of all local irritating factors, attention to errors in metabolism, and correction of plus and minor occlusion or articulation are your measures of relief. If that is not work for the general practitioner, then all your restorative services are unworthy of your calling. I feel that many general practitioners are neglecting a

valuable phase of dentistry. Trench mouth is an acute infection which attacks the gingivae and produces ulceration of characteristic appearance. It may appear around a single tooth, alone, as in the case of an erupting third molar, or as a generalized condition about the mouth. The gingival crevice is the first point of attack. Although ill-kept mouths are especially susceptible to this infection, the virulence of the germ and its ready transmission by contact make no one immune. Its extreme prevalence during the last war earned for it the term *trench mouth*.

You are all no doubt familiar with the symptomatology. You should learn to make quick differentiation between this disease and periodontal gingivitis of functional pathology. In trench mouth you will note a grayish white membrane, easily removable and easily provoked to hemorrhage. The fetor, salivation and loss of appetite are always very markedly characteristic. Bacterial examination is not necessarily conclusive. The Vincent's spirilla may be recovered from many apparently normal mouths. A vast preponderance of these organisms gives rise to unmistakable symptomatology for a differential diagnosis. It is significant, in connection with the gingivitis related to periodontoclasia, to remember that in trench mouth the symptoms are the very opposite. Gingivitis of periodontoclasia occurs usually in the middle-aged, as against the young age of trench-mouth victims; it has a slow onset, as against the rapid, sudden feature of the specific germ disease; it is not associated with pain or ulceration or glandular involvement or febrile symptoms.

The treatment of trench mouth may be considered under two headings, a negative and a positive. On the one hand, you are not to do any surgical work until the acute symptoms have disappeared, since there is serious danger of opening up channels of systemic absorption. On the side of positive treatment it is well to remember that since the specific organisms are anaerobic, they die when they come in contact with oxygen. The tissues may therefore be thoroughly swabbed with peroxid of hydrogen. There are many drugs advocated for direct therapy of the tissues. I shall give you my own treatment at this time in the interest of brevity. I follow up the peroxid of hydrogen treatment with application of 1% acriviolet and have the patient wash the mouth thoroughly with sodium perborate, which is known to give up oxygen in the presence of moisture. I then apply a 5% solution of salvarsan in glucose, permitting the contact of drug and tissue for fifteen to twenty minutes. I have never found this treatment faulty. If you are assiduous in this procedure daily and are assisted by your patient to the extent of absolute cooperation as regards home care, the case will clear up within two weeks. Home mouth-washing with permanganate of potash or sodium perborate must be done every hour or two.

#### DISEASES AND SURGERY OF THE ROOTS OF TEETH

Acute abscesses of teeth are a frequent problem for you. The question as to the advisability of extracting such teeth during the acute stage may be thus determined:

If you can remove the tooth without much trauma to the surrounding tissues (all extractions cause some trauma), well and good. But if, on the other hand, you decide that the tooth is so formed and so invested as to make its delivery difficult, it is better to defer extraction and establish drainage by an incision in the muco-buccal fold.

If there is x-ray evidence of rarefying osteitis beyond and around the apical portion of the acutely abscessed tooth, only light curettage should be indulged in. Just the barest kind of stroking with the curet will break up the necrotic tissue and facilitate the efforts of nature to carry off the toxic exudates.

The operation of cystectomy in the presence of acute abscess symptoms should be deferred until the chronic stage.

Removal of teeth in the chronic stage, where curettage is indicated by the x-ray evidence of bone infiltration, may be effected in two ways: (1) forceps removal and intra-alveolar entrance with the curet, or (2) removal by means of an open dissection of the tissues buccally, permitting free inspection of the involved area and curettage through the opening thus created.

It is significant to bear in mind that nature frequently removes in her own way many dark areas that are in apparent need of surgical removal. Bone areas during acute inflammation may show dark, spotty x-ray shadows. On the cessation of acute symptoms, without bone surgery, these dark areas frequently disappear and return to normal when the inflammatory exudates have been carried off by the lymphatics. Cystic processes or radio-

lucent x-ray areas showing definite limiting sacs require complete enucleation of the membrane. Do not curet the bone that lies directly beyond the membrane of the cyst.

For reasons of psychological significance you should exercise the most careful judgment in the removal of acutely diseased molars that are associated with swellings of the face tending to external pointing. Should you extract the tooth several days prior to a subsequent necessary extra-oral incision, the layman is quick to point suspiciously to the significant time relationship and confuse cause and effect. Make your intra-oral incision for drainage first, if you will, but if the abscess needs extra-oral drainage, do that before removing the offending tooth. Briefly, the extra-oral incision technic consists of incising the skin and fascia at the point of the greatest dependency of the abscess and then enlarging the opening subcutaneously with hemostatic forceps. The forceps are introduced closed and then opened when inside the wound. A gauze or rubber drain is introduced after gentle compression of the wound to express the discharge of pus, and wet dressings are applied. Ice is of no value now. Cold applications are used to abort abscess formation. Once suppuration has set in, warm applications facilitate nature's processes.

The recovery of the roots of fractured teeth or the removal of the remains of teeth which have fractured at some past operation might well occupy, even briefly, more space and time than I have devoted thus far to the evening's discussion. I shall show you a series of slides to portray my





Fig. 7

The first step in the recovery of a fractured root. The knife is used for making the incisions preparatory to the reflection of the mucoperiosteum to expose the underlying bone, which holds the fractured apex.



Fig. 9

Removal of the labial alveolar plate with the rongeur. This bone must be removed in order to bring the fractured apex within the direct vision of the operator.



Fig. 8

The mucoperiosteum reflected from the bone. The apex is still invisible to the eye of the operator.



Fig. 10

Showing very clearly the root which has been brought within the field of direct vision by the removal of the labial bone, as indicated in Fig. 9.

technic of the use of the flat spear bi-bevel drill in this operation. I have eliminated chisel-mallet force completely in my technic. You are all thoroughly familiar with the dental engine and its possibilities for your surgery on tooth structure. Its amazing possibilities in jaw-structure surgery lie ahead of you. If I can point the way to a technic that will remove hitherto unsurmountable barriers for you, I shall be amply rewarded in the feeling of having made a distinct contribution to dental science.

I realize how difficult it is to introduce a new or a modified technic to the profession. From a description one can frequently gather the essentials. Only by practice can one finally master the practical application of the steps in the operation for tooth delivery here portrayed. Briefly, my technic in the use of the drill, a flat-sided, spear-pointed instrument in the dental engine, is as follows:

I prepare a path through the alveolar plate, which has been temporarily denuded of mucoperiosteum, for the reception and direction of lever force. I do not drill out roots. My drill does rapidly, without trauma, what you try to do with chisel and mallet force or by the application of hand-chisel pressure. You endeavor to carry your lever to the point of most strategic value in order to be able to lift your root free of the bone. That is just what I do. The difference consists in the preparatory stage. Instead of the removal of bony investment with chisel-mallet force, or with hand-pressure chisels, to carry your lever against the root for delivery, I enter the bone and travel toward the



Fig. 11

Introduction of the author's flat spear drill in the axial line of the root directly beneath the fractured portion, which has been brought to view as in Fig. 10.

embedded root so that I will not find it necessary (1) to pound against the jaw with the mallet and (2) to bring into play the exercise of excessive hand-pressure. Both these procedures may cause much post-operative swelling.

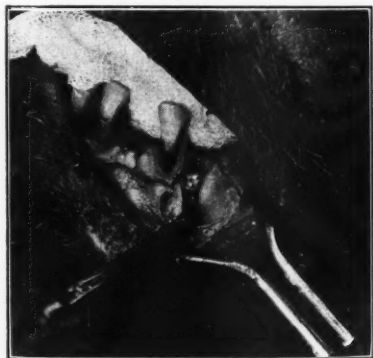


Fig. 12

Introduction of the author's patholever into the opening made by the spear drill. An arcing motion of the wrist with the lever in position engaging the apex will promptly effect the delivery of the fractured root.



Fig. 13

Following removal of the root, as shown in Fig. 12, and trimming down of the bone margins with rongeur, curet, or small stone, as shown in Fig. 14, the mucoperiosteum is replaced with bilateral suturing, as shown in this illustration. Introduction of a medicated dressing into the alveolus is indicated only if there is an insufficient blood clot following the operation.

and indications for this technic. As you take up the work, you will find its usefulness and availability ever increasing.

In bringing this paper to a close I must tell you that I regret that I am compelled to eliminate many points of interest which in my outline to you I had planned to dwell upon. If time permits, perhaps we may talk over some of these factors in the discussion. One point I do want to impress upon you in closing. It concerns a differential diagnosis of swellings about the face. Be on your guard, lest you be drawn into difficulties and embarrassments in making a diagnosis of dental pathology where there may be, as so often occurs in my practice, a swelling about the face which may be due to a catarrhal sinusitis, a parotid gland calculus or Stensen's duct obstruction, a submaxillary gland calculus, malignancy in the

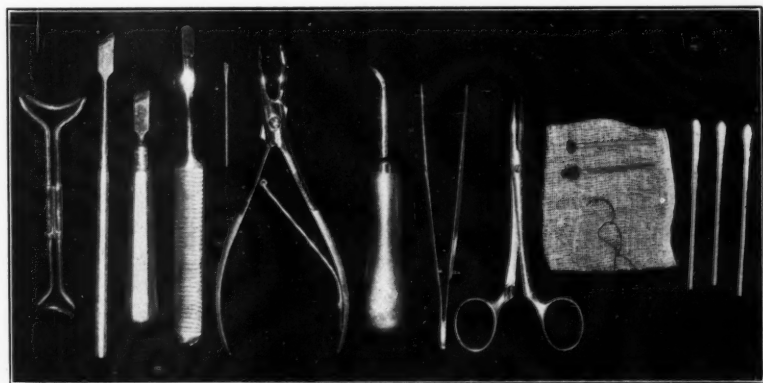


Fig. 14

A simple array of instruments used by the author for oral surgery.

The drill is so successful in my hands that I feel justified in remarking that the post-operative results are most happy. There are many variations of

mandibular third molar areas, erysipelas, or a hair follicle abscess on the face.

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## Preventive, Therapeutic and Reconstructive Dentistry

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It is realized by the educators and leaders in our profession that dentistry is undergoing a great change. We hear the comment made that dentistry in the past has been concerned mainly with restoration and repair, and that the future of dentistry is going to devote its attention to prevention instead of reconstruction and repair. For that matter, medicine also has realized the importance of prevention instead of cure, but the problem in the medical profession, although similar in many respects to that in the dental profession, nevertheless is clearer than that in dentistry. Medicine in the main is concerned with many diseases, with their treatment and cure, and naturally the next great step is to study their prevention and adopt measures to carry out their plans. In other words, the medical profession realizes the meaning of prevention and understands the methods necessary to attack the problems. With dentistry the problem is more complicated.

The dental profession is concerned primarily with the dental apparatus and the tissues of the oral cavity related to and supporting the teeth. Realization of the systemic connection of the teeth needs no further discussion, and for this reason the contention that a proper understanding of medicine is necessary for the practice of dentistry becomes apparent from a theoretical viewpoint. However, from a practical viewpoint a doubt exists as to whether we are following wise procedures in burdening the dentist with a further training in medicine. In other words, there are

some sincere and conscientious individuals who still maintain that dentistry is concerned mainly with technical problems and therefore necessitates a training of proper dental technicians. For this reason it would be wise to analyze the actual work we perform and the practical problems that present themselves in our profession.

As was said before, we are primarily concerned with the teeth and the other structures that go to form the dental apparatus. Our problems should be the treatment necessary for the maintenance of a full complement of natural teeth in a healthy condition without becoming a systemic menace to the individual. As ideal professional men this should be our goal, and any procedure or operation necessary in the individual case to maintain that full complement of healthy teeth could rightfully and properly be classified under the heading of therapeutic dentistry.

### DISEASES OF THE DENTAL APPARATUS

In performing our work we are called upon to treat and cure certain diseases and repair the damages of these diseases in order to prevent the loss of teeth.

The three main diseases of the dental apparatus are dental caries, erosion and periodontal disease. Of course we must mention also Vincent's infection, pulpitis, granulomas, dental abscesses, cysts, and other inflammatory and diseased processes that come under our supervision, but the majority of the

latter either are results of neglect of the former diseases or are not so prevalent as to present such a serious problem. At least, their prevention, treatment and cure are self-evident.

The prevention, treatment and cure of caries and erosion are the problems that mainly concern us in our work; but, although theoretically this should form the greatest part of our services, the most remunerative work in the majority of dental practices is the reconstruction and repair of the mouth with the replacement of teeth by artificial substitutes. However, not to digress from the subject of dental caries and erosion, let us consider the actual operative procedures necessary for the treatment of these two diseases.

We realize that dental caries is a disease that attacks and destroys the individual tooth by penetrating through the enamel into the softer layer of the dentin, forming a cavity of infected tooth structure that requires our attention and treatment. We know that it is necessary for us to cut away the diseased and infected tooth structure, sterilize the remaining cavity and, after preparing it according to certain scientific principles of retention and prevention of further decay, replace the lost tooth structure by some foreign material and thereby reconstruct the anatomical form of the tooth. It has been said, on certain occasions, that dental caries and erosion are incurable, but this statement is misleading. Dental caries and erosion are curable.

When we cut away diseased and infected tooth structure and treat the remaining part of the tooth by anti-septic methods, we are checking decay in that particular tooth and are curing

that tooth from the progress of dental caries and erosion to the same extent that the surgeon cures appendicitis by appendectomy or any other inflammatory process by a surgical operation. We have cured that tooth from the disease of dental caries or erosion by our operative or surgical procedure. Yet we are concerned with another problem in our work. Nature has so constructed the teeth that after they are destroyed by disease it is impossible for her to reconstruct the anatomical form by a natural process of repair. For this reason the dental profession is confronted with technical problems of a mechanical and physical character in the reconstruction of the individual tooth. It is this responsibility of dentistry that complicates our problems of prevention, treatment and cure of the diseases attacking the dental apparatus.

It is the prevalence of dental diseases and the necessity for repairing the ravages created by them that have kept us interested and absorbed in the mechanical principles of repair. We must not ignore these mechanical problems, because they are important. Proper technical procedures in the reconstruction of a tooth in the dental apparatus as a whole involve certain principles as well as careful and skillful manipulation to check further loss of tooth structure. But we must not forget that there is a connection between the teeth and the rest of the body. We must remember that, in spite of all our technical skill and carefulness, there is a systemic factor that aggravates the problem of prevention of dental disease and the repair and retention of the teeth.

Clinical evidence in abundance

points to certain systemic factors that either prevent or create dental destruction, regardless of local and mechanical conditions that are favorable or unfavorable. It is therefore necessary to study these systemic factors, their connection with the condition of the dental apparatus in the particular case, and the methods whereby we can attain a healthy and favorable physiological environment for the dental apparatus. In other words, the greater medical training the dentist obtains and the more dental training the physician receives, the better opportunity for cooperation between the two professions will result. With this cooperation the systemic problems of the prevention of dental diseases, namely, caries, erosion and periodontoclasia, when solved will greatly reduce the necessity for reconstruction and repair. Research work of this character presents the greatest hopes for the future of preventive dentistry. Nevertheless we must realize the limitations in that direction and not neglect the local and mechanical factors involved in therapeutic dentistry.

#### PREVENTIVE DENTISTRY

The three terms *preventive dentistry*, *therapeutic dentistry* and *reconstructive dentistry*, as employed today, are hazy and relative in their meaning. Every operation we properly perform, whether it is curative, palliative, reparative or reconstructive, is a therapeutic measure, in order to check an existing disease and prevent a more serious condition that will follow its neglect. The viewpoint of many is that there is no need for the term *preventive dentistry*. But, in order for us to

make further progress in maintaining a healthy oral cavity and the natural dental apparatus, we must come to a definite understanding of the term *preventive dentistry* in distinction from the terms *therapeutic* and *reconstructive dentistry* and of the work we perform in the various divisions we have mentioned.

It goes without saying that our ultimate and definite goal is to maintain a full complement of healthy teeth throughout the age of the individual, and any procedure, whether surgical, mechanical, technical or biological, that helps us to maintain that goal should receive a classification that can rightfully be called therapeutic dentistry. However, when we are confronted with a diseased and broken-down dental apparatus that necessitates extensive extraction, replacement of many missing members and the construction of a proper denture, we are in the realm of reconstructive dentistry. Reconstructive dentistry may be also a therapeutic measure to check the further loss of teeth, but we must not forget that, regardless of the skill, care and realization of certain fundamental principles on the part of the operator, reconstructive dentistry is to a great extent as much destructive as constructive.

The mechanical problems involved no doubt are important and favorably affect the results if properly solved by the individual technician, but we realize that the replacement of numerous teeth is done at the expense of the abutment teeth. Of course due consideration must be given to systemic factors and local conditions, and many instances can be cited where the proper



restoration and replacement of teeth have restored the health of the remaining teeth as well as that of the abutment teeth. We must nevertheless realize that we are confronted with substitutes that cannot be relied upon indefinitely or considerably. It is this distinction of our work of the reconstructive from the therapeutic procedures in the form of the treatment of conditions to help maintain a natural healthy dental apparatus that must be made in order to understand our responsibilities.

In making any classification we must always realize that the division of one class from the other is not abrupt. There may be an overlapping of purposes in the operations we perform. For instance, where we have a single missing tooth or certain spaces that cannot or are inadvisable to be closed by orthodontia, it may necessitate the insertion of a bridge or other reconstructive measures. This procedure is rightfully entitled to the classification of therapeutic dentistry. The replacement of many missing teeth, however, is in the realm of reconstructive dentistry. Let us now consider the various measures we institute under preventive dentistry and operations we perform under therapeutic dentistry.

Preventive dentistry is mainly biological in character, and the treatment necessary is systemic. It is the connecting link between the two professions of medicine and dentistry. It involves dietetics and endocrinology, and as a profession we are not yet practically prepared to solve these problems. Suffice it to say that the future of dentistry will concern itself with these biological problems to a greater extent

than it does at present, and there is no question that a considerable reduction of our actual reparative work on the dental apparatus will follow. The other measures of preventive dentistry are general and dental hygiene. Let us now consider the immediate technical and operative procedures that we possess at present for the maintenance of a full complement of healthy natural teeth that we can properly call therapeutic dentistry.

First, we have that branch of our profession we choose to call orthodontia. The realization of the importance of proper orthodontic treatment at the proper time is self-evident. The dental apparatus, being a combination of individual members, must function cooperatively to avoid excessive strain and trauma that undoubtedly, sooner or later, develops into an irritation that causes some ultimate inflammatory process in the structure of the dental apparatus. Orthodontia has many problems to solve in order to attain the proper recognition as the important therapeutic and preventive measure in dentistry. We shall not discuss them at length. Suffice it to say that orthodontics, to become successful, should be considered not as an orthodontic problem but as a dental problem. Biological factors are very important and considerable research in that direction is most urgent.

#### OPERATIVE DENTISTRY

The next important branch of dentistry we are to consider is what is known as operative dentistry. It consists of all the operations necessary for the treatment and cure of dental caries, erosion and periodontoclasia, as well as

the repair of the individual tooth that has already been attacked by dental caries or erosion. It is a surgical procedure, because it involves cutting and grinding into tooth structure as a therapeutic measure to check the existing disease or condition and prevent the loss of the individual tooth. In spite of systemic and local disadvantages, if properly performed, it is the best means we have today for the purpose.

This branch of dentistry has received considerable study in the past and the methods developed have been very scientific and successful, but we must not forget that the results of operative dentistry depend for their success on the skill and care of the individual operator and his willingness to observe certain definite scientific principles. Recognition of this factor must be made in its consideration as a therapeutic measure. We need only mention the various rules of asepsis, sterilization, extension for retention, and other precautionary measures and scientific principles. But at the same time we must not overlook the fact that we are dealing with vital structures that respond to our treatment relatively and variably.

We can train skillful operators and teach scientific principles, yet the resultant products depend on the mood of the individual operator at the time of the operation, the skill of the operator, the condition and cooperation of the patient, and other such circumstances. Although there is no doubt that the prevention and control of dental caries, erosion and periodontoclasia by systemic study and treatment will be the most effective measure in the retention of a full complement of

healthy teeth, operative dentistry is the best adjunct we have today for that purpose and will always remain an important therapeutic factor in the future.

The question then arises as to the reason for such an abundance of edentulous mouths and crippled dentures, since so much improvement and advance have been made in this branch of dentistry. We have tried to answer this question by extensive oral hygiene campaigns, explaining the importance of early attention to defects of the teeth. We are teaching proper prophylactic measures and have influenced the public considerably, but little progress has been made, although it may appear otherwise to many observers.

The public may be more dentally minded, but the actual results of preventive and therapeutic dentistry as shown by the conditions of the mouths of the adult population on one hand and the children on the other are not a credit to the profession. That there exists faulty operative dentistry in great abundance cannot be denied. That some of this faulty work is uncontrollable and not entirely due to wilful neglect on the part of the dentist must be admitted. But we cannot overlook the fact that the dental profession has a responsibility to meet and must meet it squarely. Operative dentistry properly performed is the greatest dental public health factor we have today and yet it is the most abused and neglected branch of our profession.

We have shown in our discussion that a good deal of technical skill and training is necessary to perform successful operative dentistry. Yet this skill is not superhuman nor so difficult

to develop. Even greater than the skill is the willingness on the part of the operator to exercise care and observe certain important principles. The more and better attention we give to the mouth prior to the loss of any teeth, the less will it become necessary for extensive reconstructive work, which is the least reliable in regard to permanence of retention.

The dental profession has been making considerable strides in technical development and training of technical experts, but our problem will never be solved unless we recognize other important factors and conditions that exist. We must realize that we need cooperation on the part of the patient and the public as a whole. The results of operative dentistry depend a great deal for their success on the time when the initial treatment and operative procedure are instigated. We must make it clear to the public that it is a duty they owe to themselves to give their mouths early and frequent attention.

Regardless of the care and skill that the operator may exercise, the success of the operation will be unfavorably affected if a tooth is too far advanced in the attack of dental disease. Furthermore, the patient must realize that the details are important, and that the best service can be rendered by the dentist only when he is permitted to give the details considerable attention. It is not a question of how many gold inlays the patient requires or how many fillings are necessary so much as it is the careful service that dentists render in locating, recognizing and correcting the little defects as well as the large, apparent ones. The sooner the public understands that it is careful, honest

dental service that it must seek rather than gold, silver, porcelain or platinum fillings and crowns, the better will the dentist be able to render a real public health service.

Of course we must admit that a great deal of the fault lies with the dentist. Because of the mechanical principles of repair and reconstruction we have so arranged our practices as to impress the patient that we are selling fillings, appliances and dentures. In our desire to earn a living we unconsciously sell restorations in preference to dental services. We have a ready market for reconstructive work, but an unappreciative market for therapeutic dentistry. There are many ideal and successful dental practices where therapeutic dentistry is honestly, carefully, skillfully and remuneratively practiced and the highest type of reconstructive dentistry is performed. But even in the most ideal office there is that inherent tendency to emphasize mechanics, reconstruction and repair and overlook the important details in therapeutic dentistry. To be more concise, we might say that in our desire to meet expenses and make our time productive we overlook the finishing details and the careful inspection of the mouth that are the important therapeutic and preventive measures for the loss of the individual tooth.

There are many other factors which we cannot control, such as the lack of cooperation on the part of the patient and the human element involved. However, in order for us to make any further progress, it is necessary for the public to understand and assume their share of the responsibility. They must recognize the human element and the

possibility of mistakes, and the only method whereby they can overcome the bad effects is constant, frequent and careful supervision and the willingness to appreciate and pay for the services necessary to perform these details. It is the cheapest and the most reliable kind of dentistry in the long run.

The problem is further aggravated by a condition that exists in the great majority of dental offices where the type of practice is not ideal. It was not so long ago that the only operative dentistry performed in a good many offices was a few sloppy fillings and an abundance of crudely formed gold-shell crowns over teeth with small pit cavities that frequently received very little surgical and therapeutic attention. This condition, though changed, exists today in some instances. As a matter of fact, there are many patients who enter a dental office for the extraction of a number of teeth and contract for their replacement without desiring that any attention be given to other teeth that are attacked by dental caries. Very often the dentist is forced to throw in amalgam fillings gratis in order to obtain the privilege of performing the necessary bridgework.

We can readily realize the seriousness of the condition and the reason for the crippled and filthy condition of the mouth of the average individual. Although there is no excuse for the guilt of omission and commission on the part of the dentist, it has been the experience of conscientious practitioners to find many apparently intelligent individuals who still cannot understand why a tooth should be ground and filled when there is no apparent, large cavity. However, in justice to the oral

hygiene campaigns and the improvement in the type of dentists, the conditions are much better today. Nevertheless there is still room for improvement.

Another factor to consider in the problem of therapeutic dentistry is the neglect on the part of the public to attend to their teeth because of fear and the inconvenience it creates. Nobody likes to go to the dentist. Yet it is our duty to emphasize the importance of early and frequent attention to the teeth by a continuance of oral hygiene campaigns and lectures, while at the same time we must emphasize the advantages of therapeutic dentistry over reconstructive dentistry.

The responsibility of our profession is clear. We cannot boast of our accomplishments nor attain proper respect unless we can become an important health factor. There is no reason why we cannot hope for a great reduction in the number of crippled dentures and disease-infected and edentulous mouths. A full complement of healthy teeth throughout the age of the individual is very possible, provided we employ the best means we have at hand today in the honest and careful practice of our profession in cooperation with the patient and the public. Therapeutic dentistry must form the greatest part of our practice, and that means children's dentistry, which is the earliest dentistry possible.

#### PROPHYLACTIC ODONTOTOMY

The greatest sin on the part of the dental profession is the neglect of children's teeth. Although there are some kiddies who make better patients than a good many grown-ups, we must admit that the child is often a very difficult

patient to handle. If we couple this with the lack of appreciation by the parents as to the value of the services and often the unwillingness to pay adequately for them, we must admit that a dentist is often a martyr to practice children's dentistry. Still it is a duty we owe to the public, to our profession, to the patient, and even to ourselves, to see that adequate and proper children's dentistry becomes the most popular kind of dentistry.

As individual practitioners it is the duty of the older and more successful men in our profession to devote some time to the education of their patients in that direction, to make them understand the value of proper children's dentistry and also realize the problems involved. The profession as a whole must do so on a broader scale. The existing conditions need most urgent correction.

Examination of the teeth of school children is sufficient to manifest the problem with which we are confronted. It is one that cannot be undertaken by the individual dentist or even by the profession as a whole without the cooperation of the public. Systemic factors and biological problems are important, but for the present therapeutic dentistry in the form of operative dentistry is the most urgent necessity. This leads us to the operative procedure that Dr. Hyatt chooses to call *prophylactic odontotomy*.

This operation is ably described by its originator and consists of a careful examination of the mouth, the location of enamel fissures, and their preparation and filling before decay sets in. Although the conclusion of the advisability of this procedure has been

arrived at as a result of considerable experience and study of the problem of prophylaxis on the part of Dr. Hyatt, it nevertheless lacks sound scientific principles. The premise is made that, since dental caries is an incurable disease, we must endeavor to prevent it, and the argument is presented that prophylactic odontotomy is a prevention for the disease of dental caries. Both of these contentions are wrong, and before we can make any definite progress we must clear up these misleading statements.

First of all, we have clearly shown that dental caries is curable, and that it is cured by the surgical operations and therapeutic procedures of operative dentistry. Secondly, prophylactic odontotomy is not a preventive measure for the disease of dental caries, but is an operative procedure that at best may be classified under therapeutic dentistry, which includes all measures to check dental disease, treat abnormal conditions and prevent the loss of teeth. The prevention of the disease of dental caries is a systemic problem and not a local problem. The mere cutting of a tooth in order to correct an anomaly or a deficient anatomical form does not prevent the onset of the disease of dental caries, but it may so change the anatomical form of the tooth as to make it more difficult for the disease of dental caries to attack that particular area of the tooth. Nevertheless it is not a measure to prevent the disease of dental caries from attacking any other surface of that tooth.

Prophylactic odontotomy may have its place in dentistry, but can only be employed conservatively and with considerable judgment. At best it can be



classed with Black's theory of extension for prevention, which also should be used with judgment. However therapeutic it may seem theoretically, it has certain practical disadvantages. As a matter of fact, the problem in children's dentistry is not so much the treatment of enamel fissures as the repair and correction of the ravages and more important irregularities that already exist.

So long as we are still faced with the problem of badly diseased and broken-down temporary and permanent teeth in early childhood, we cannot attempt to perform operative dentistry and surgery on teeth that are not yet diseased. Surgery, above all, must be conservative. But there are still other disadvantages to the promiscuous employment of prophylactic odontotomy.

We have previously shown that the results of operative dentistry are to a certain extent uncontrollable by the profession as a whole. Failures are possible in the hands of the most skillful operator, regardless of the care employed. It therefore becomes self-evident that a great deal of the recurrence of decay is due to improper materials and faulty technic, and, if this condition exists as a result of operative dentistry performed on diseased teeth, how are we going to control these same conditions when we employ operative dentistry on teeth that are not yet diseased?

We can readily realize and understand that the earliest attention to dental caries affords the most successful results. Yet we are not prepared to state that the dental structures are willing to tolerate surgical interference when there is no existing disease.

Granting that no harm will be performed by the actual surgical operation of odontotomy in repairing the cavity created, we are still confronted with the physical and mechanical factors that may lead to failure. Although we may use the best materials, employ the most careful and skillful workmanship and avoid mistakes, we are not so certain that we are not creating access for the entrance of bacteria through the margins of the resultant filling. Again we entirely overlook the biological factors that ultimately simplify the mechanical and reparative problems as well as offer resistance to the onset of disease.

There is no doubt, however, and we cannot emphasize it too much, that the earliest and most careful attention to children's teeth is a professional and public responsibility, and if proper and careful supervision is carried out, it is for the welfare of the child that we postpone grinding and operative procedure. Children are often very difficult to handle, and it takes considerable patience to grind teeth that are already attacked by caries, let alone aggravating the problem by grinding on healthy teeth. Enamel fissures can be treated more conservatively by Howe's silver-nitrate and formalin method.

Howe has devoted a good deal of his life to children's dentistry, and in his work he has experimented considerably with the silver-nitrate technic. It consists of isolating the tooth, drying the fissures and treating them with silver nitrate and formalin. It is a method that deserves much consideration, but supervision of the child is the most important factor in the main-

tenance of a healthy oral cavity and dental apparatus.

It might be appropriate to discuss briefly the preventive measures for periodontoclasia. Grinding of teeth and correcting traumatic occlusion are not preventive dentistry. It may be therapeutic dentistry to correct an existing faulty condition in order to avoid the onset of the form of periodontoclasia that may be caused by traumatic occlusion. This procedure should also be used with caution, because it is a surgical procedure which consists of grinding of teeth, and all surgery should be conservative. Preventive dentistry in distinction from therapeutic dentistry, as was stated before, is more or less biological in character.

Although it involves systemic and medical treatment, we must include general and local hygienic measures, and anything that the patient can do at home in the form of proper brushing, careful cleaning of the teeth and massaging of the gums is truthfully preventive dentistry. Preaching and teaching of oral hygienic measures also are preventive dentistry. It might be interesting to point out that proper physical and medical care may be the best kind of preventive dentistry. At the same time we must realize that proper dentistry is an important factor in preventive medicine. It is this interdependence of the two professions that cannot be overemphasized.

#### RECONSTRUCTIVE DENTISTRY

Theoretically speaking, in order that dentistry may become an important measure in preventive medicine, every operation we perform or every restoration we construct should be therapeutic

in its character. Reconstructive dentistry for that reason should be therapeutic or it has no reason for existence in the profession of dentistry. But this ideal condition is impossible of attainment. Reconstructive dentistry, although in a good many instances therapeutic in nature, is also destructive in its character. It is for this reason that it becomes necessary for us to make a distinct classification for reconstructive dentistry.

Reconstructive dentistry therefore includes replacement of missing teeth and other measures to build up a broken-down dental apparatus. Clinical experience tells us that the larger the span of replacement, the greater the strain upon the abutment teeth and the supporting structures. A single tooth replacement which is done mainly for the purpose of checking the movement of teeth, prevention of the subsequent creation of trauma and finally periodontoclasia, if properly performed and appropriately placed, could be classified under therapeutic dentistry. The replacement of many teeth, the construction of partial and full dentures and the insertion of extensive fixed and removable bridges should be classified under reconstructive dentistry.

Of course we realize that the success of our restoration and replacement depends a good deal on the skill and care of the dentist, but even greater than the actual workmanship is the importance of the realization of certain mechanical and physical principles. Occlusion in function as well as other forces and stresses must be studied, and, regardless of the beautifully polished dental jewelry we may create, the result of the operation will

lead to failure if these factors are overlooked. The treatment of abutment teeth is the greatest problem with which we are confronted in this work.

Whether we will it or not, and regardless of the type of bridge or denture we employ, any replacement or reconstruction adds a burden to the abutment teeth. We may at times benefit the latter by the splinting and functional action of dentures and bridges, thereby strengthening the supporting structures, but still we cannot entirely eliminate grinding and cutting into healthy tooth structure or subsequent abrasion caused by attachments used for retention and balancing. It is this characteristic of reconstructive dentistry that must be considered in its valuation as a therapeutic measure of dentistry. The solution of mechanical and technical problems, important as they are, will not entirely remove the destructive nature of reconstructive dentistry.

Realizing the importance of the technical and mechanical factors, our educators are still obsessed with the idea that the elevation of dentistry as a public health factor lies in the training of technical experts. The faulty bridge and ill-fitting denture can no doubt become irritating factors for any systemic involvement, yet it is the biological problems when solved that will in many instances help simplify and eliminate the mechanical and technical problems.

Let us take the mere construction of a simple single-tooth bridge. Whether we employ a fixed, fixed-removable, removable or movable-removable type of replacement, we are forced either to cut into the abutment teeth or

to tax them with the support of clasps. We admit the necessity of careful workmanship and allow for the important realization of mechanical and physical principles, yet we are faced with the solution of biological and systemic problems in the reaction of the saliva and the other excretions and secretions of the alimentary tract upon the cement that is the important factor in the protection of the abutment teeth and the retention of the restorative appliance, as well as the abrasion and erosion created by the retaining clasps of the simple removable bridge. There are many technical details that the profession as a whole cannot control in reconstructive dentistry. The finest piece of movable or removable bridge-work can fail as a result of the mere detail of cementation, but what we can endeavor to control is the solution of biological problems so as to help us maintain a proper environment for our mechanical restorations.

The question of the action of saliva upon the cement, which is the retentive factor in inlay and other abutments, is an important biological problem. There are certain mouths in which cement cannot remain without dissolving, and clinical experience shows this in abundance. Sometimes the cause is found after a careful physical examination and when cooperation with the physician is obtained. Very often many serious systemic disturbances are recognized in this manner. Reconstructive work is a necessary adjunct to the profession of dentistry and can accomplish considerable benefit for the human race if properly practiced.

The most serious criticism of the dental profession is the charge that the

greatest and most popular service the dentist renders is reconstructive and replacement dentistry. Properly performed it is deserving of considerable praise, but too much emphasis cannot be laid on the fact that it is our duty to reduce the amount of reconstruction work by proper therapeutic and preventive dentistry. That does not mean that we can entirely eliminate reconstructive dentistry, but we can decrease its amount, improve its type, favorably effect its results as a therapeutic measure and master the biological factors in such a manner as to aid us in our work.

The responsibility of the profession becomes clear when we briefly analyze the conditions that exist relative to reconstructive dentistry. We know that careful workmanship is necessary, but the type of reconstructive dentistry that was practiced in the past and is in the majority of instances practiced today is a great deal more destructive than it necessarily should be. Precision work of either a fixed or a removable character is the most successful reconstructive dentistry from a mechanical and functional viewpoint. Work of this character needs individual attention, and, although there is a place for the commercial laboratory in all forms of reconstructive dentistry, we must realize that the contact of the latter must exist directly with the dentist. Exceptional and individual development of reconstructive dentistry becomes an art and should be encouraged. As an art it is a luxury for the very rich, and we cannot as a profession assume the responsibility of creating every resultant product so perfect as to attain that classification. We

cannot assume the burden of placing artistic "Rolls Royce" dentistry in the mouth of a patient who cannot afford the "Ford" type of dentistry. However, a market for individually constructed, artistic precision dentistry should be created and encouraged.

As a profession we owe to the public a certain amount of consideration in reconstructive dentistry. Infected teeth that cannot be properly treated must be removed, and it is our duty to see that simple and inexpensive reconstruction work is offered to the public. At the same time we must realize that it is impossible to perform proper replacements cheaply. There is a certain responsibility and burden that the public must assume, and people must be made to realize that when they have come to the point where they need dental appliances as a result of early neglect of their teeth, they cannot expect to get artistic, luxurious dentistry at the price of cheaper necessities.

Our responsibility in dentistry ends when due public consideration is made in the realm of preventive and therapeutic dentistry, but only in rare cases can we burden our professional responsibilities with reconstructive dentistry. We can to a certain extent help reduce the cost of reconstructive dentistry by simplifying the technic, yet our duty to the public ends when we endeavor to reduce the amount of reconstructive dentistry.

It is for this reason that the commercial laboratory is a necessary and beneficial adjunct to the profession. While the best reconstructive dentistry can be performed by a dentist who is well trained and able to carry out the work from beginning to end, it is often

very much less costly and better done when we allow a trained individual to perform the actual laboratory work. The most ideal condition is the employment of a laboratory technician in conjunction with the dental office in such a manner as to allow for the utmost cooperation. But this condition is economically impossible in the majority of cases. The commercial dental laboratory is here to stay, but its contact should be only with the dental profession and not with the public.

The most beautifully constructed and polished restoration will be of little value if the actual work at the chair is not properly performed. For this reason it becomes self-evident that reconstructive dentistry must be included in the active practice of the dental profession, regardless of the development of the dentist in the biological sciences. To broaden the scope of the dental technician and dental laboratory can only do more harm than good. It will revert to the same conditions we are endeavoring to correct at present by creating an authoritative group of dental technicians whose ultimate purpose, in their struggle for existence, will be the creation of a market for replacement dentistry in preference to therapeutic dentistry. The public must be made to realize the importance of this problem. Reconstructive dentistry should remain under the control of the dental profession, and the training of dental laboratory technicians must be so guided as to remain an adjunct of the dental profession under its control, and not a public factor.

## CONCLUSIONS

(1) Preventive dentistry is mainly biological in character and includes all measures of oral and general hygiene.

(2) The goal of the profession should be the maintenance of a full complement of healthy natural teeth throughout the age of the individual in such a manner as not to become a systemic menace, and any work we perform in our practice to attain that goal should receive a classification that can properly be called therapeutic dentistry.

(3) Reconstructive dentistry should receive a distinct classification and should include replacement of missing teeth and the reconstruction of a broken-down dental apparatus with artificial substitutes in such a manner as to function properly.

(4) Realization of the destructive character of reconstructive work must be admitted, and this characteristic must be kept at a minimum.

(5) It is the duty of the profession to reduce the amount of reconstructive work, yet it should be kept within the realm of the biologically trained dentists.

(6) Artistic and properly performed precision reconstructive dentistry must be considered as a luxury.

(7) The solution of the biological problems will help to simplify the mechanical and technical difficulties, and the profession of dentistry must prepare itself to solve these problems.

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## Anatomical Landmarks In Dental Roentgenography

By ROBERT M. FISCHER, D.D.S., New York, N. Y.

The success of any treatment to which the body is subjected depends upon the very foundation of all dental and medical practice—anatomy. Without a comprehensive knowledge of the nomenclature, position and relationship of the parts in which the individual practitioner is specifically interested, any attempt at treatment, no matter what the disease or lesion, is insecurely founded.

The field of dental roentgenography makes even greater demands upon the dentist's fund of anatomical knowledge than any other type of work in our sphere, save, perhaps, oral surgery. Not alone in the technic of placing the film and making the exposure does the operator require a complete knowledge of the normal appearance of the sub-mucous regions, but in interpretation as well must he be absolutely certain of his ground, lest he make diagnostic errors that will lead to disaster. Because of the vastly important rôle that anatomy plays in roentgenography, the writer has deemed it fitting to describe the appearance, under the x-ray, of the mouth both with and without the teeth. In this and succeeding articles three terms, whose exact definitions are somewhat obscure to many dentists, will be used more or less frequently. They are:

- (1) *Radioparent*—Applied to objects which offer no resistance to the passage of x-rays. Examples include skin, mucous membrane, pulp, peridental membrane, pus,

air, celluloid, cotton rolls, aluminum, cardboard.

- (2) *Radiolucent*—Applied to objects which offer partial resistance to the passage of x-rays in varying degrees. Examples include enamel, dentin, cementum, bone, lamina dura, pulpstones, salivary calculus, calcium, bismuth, silicates, porcelain.
- (3) *Radiopaque*—Applied to objects of such molecular density that they are impervious to x-rays. The shadows they produce on the negative are very light. Examples include gold, amalgam, gutta-percha (when condensed), vulcanite, steel, lead, platinum, etc.

Fig. 1 illustrates the usual method of making a complete mouth series with fourteen films. This is the minimum number of exposures that will permit the observer to obtain two views of every tooth in the mouth except the third molars and central incisors. That at least two views of each tooth are necessary may be readily understood when one realizes that a roentgenogram taken at an angle perpendicular to the long axis of the tooth will, because of superimposition of overlying structures, frequently fail to show everything in that region. The negatives here illustrated are mounted in such a manner as to make the observer appear to be looking from within the mouth outward; in other words, the films on the left side of the median line are actually views of the left side. Beginning with

FIGURE 1—UPPER



No. 1



No. 2



No. 3



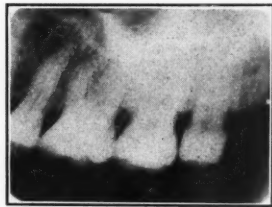
No. 4



No. 5



No. 6



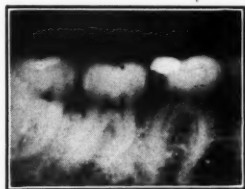
No. 7

the median line, No. 4, one obtains a roentgenographic view of the two maxillary central and lateral incisors. Above and between the apices of the centrals is a heavy shadow, shown as a broad, straight line—the septum of the nose. The fact that it is lighter in appearance than the surrounding areas of bone indicates that this structure is of greater radiopacity. This of course is caused by the angle at which the rays

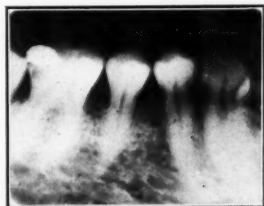
strike it, making it necessary to penetrate the septum along its thickest dimension, that is, from above downward.

Immediately below the shadow of the septum and directly between the apices of the central incisors is a dark oval shadow, caused by the incisive foramen, frequently erroneously referred to as the anterior palatine foramen. This opening in the median line

FIGURE 1—LOWER



No. 8



No. 9



No. 10



No. 11



No. 12



No. 13



No. 14

of the hard palate varies in size in different individuals and may sometimes be slightly diverted to one side. It is the cause of one of the most frequent errors made in roentgenographic diagnosis, since by its radiolucency it often resembles a small cyst. When the apex of a central or even a lateral incisor is projected over the incisive foramen, the inexperienced interpreter may easily be trapped into believing that bone pathology exists.

On each side of the nasal septum is a large radioparent area caused by the unobstructed passage of the rays through the two air chambers in the nose. On the left side of the nasal fossa in No. 4 the shadow of the middle turbinate bone may be seen. Sometimes a supplementary shadow, darker than that of the nasal fossa, may appear below it. This is the superimposed shadow of the nostrils.

In Nos. 3 and 5 the nasal floor fades

from prominence, and a new region of radiolucency makes its appearance in the distal upper corner of each. This is the anterior portion of the maxillary sinus, which frequently extends forward to a point corresponding to the apex of the canine and at other times may not be visible anterior to the first molar.

Upon closer inspection we may observe the phenomenon previously referred to, that is, the superimposition of the apices of both maxillary central incisors on the incisive foramen. This is of course the result of changing the angulation of the exposure so as to bring the canine into greatest prominence. In stout patients a fold in the tissues is frequently seen extending downward and backward from the nostrils. In the effort to keep the mouth open while the film packet is held against the palate, this fold is accentuated and manifests itself as a curved line of radiopacity in the region of the apex of the canine. It is not visible in the accompanying series, as the subject was a slender individual.

Nos. 2 and 6 show the bicuspid region. The value of having two views of the same area is seen by comparing Nos. 5 and 6. The first bicuspid is included in both of these, but in the roentgenogram taken straight through the tooth the wide separation of the two roots is not seen. No. 5, of course, shows it quite clearly. Above the apex of the second bicuspid on each side the antrum is clearly visible, with the palatal root of the first molar, best seen in No. 6, appearing to enter the floor of the antrum. The roots of maxillary molars, however, rarely enter the antrum. Studies of sections of the

upper jaw show that the antrum floor frequently extends below the apices of the molars, but *between* the buccal and palatal roots. Occasionally one or all of the roots of a molar will invaginate the antrum floor, but if a good roentgenogram is made, the line of the peridental membrane may be followed around the apices, and, if it is unbroken, it is quite certain that no communication exists between root and antrum.

Occasionally the antrum may be interpreted as a cyst, especially if it is above a non-vital tooth. Although it is obviously impossible to outline a dogmatic rule as to how to guard against making such a diagnostic blunder, one anatomic feature may usually aid in forming the opinion. If the peridental membrane and the lamina dura can be traced as an unbroken line around the apical end of the root, one may be fairly certain that the suspected tooth is not the causative factor. Thus in No. 1 these two structures may be traced around the apical end of the non-vital second bicuspid, eliminating the possibility of associating this tooth with the radiolucent area above it.

In negatives Nos. 1 and 7 the projection of the malar process may be seen as a U-shaped radiopaque line above and between the apices of the first and second molars. Immediately posterior to this process is a dense shadow caused by the malar bone, frequently the cause of considerable annoyance when trying to obtain an unobstructed roentgenogram of the apices of the second and third molars.

Posterior to the third molars is a shadow of slightly less density than that of the bone surrounding the maxil-

lary teeth. This is caused by the superimposition of the anterior border of the coronoid process of the mandible. Although it bears no resemblance either in form or in density to a tooth, it is sometimes diagnosed as an impacted maxillary third molar, when the latter is missing.

Considering now the mandible, one finds fewer disturbing anatomical landmarks, though sometimes those present are confusing. The mental foramen appears on the negative as a dark circular shadow similar in size to a granuloma. When the apex of one of the bicuspid appears directly over it, especially if the tooth is non-vital, the two ways of deciding its true identity are:

- (1) By attempting to throw off the superimposed shadow by change in angulation.
- (2) By attempting to trace the line of the periodontal membrane and the lamina dura completely around the apex.

In the accompanying series the mental foramen may be seen in Nos. 9 and 13, below and between the apices of the mandibular bicuspid, but there can be no doubt as to its identity.

In the molar region a dense, light shadow may be seen commencing about the middle of the roots of the second molar and curving upward and backward. This shadow may vary in width from a broad band to a fairly thin line and is caused by the external oblique ridge of the mandible. Because of its density it frequently obscures important parts of the crown of the mandibular third molar. In Nos. 8 and 14 it obscures exactly one-half of the pulp chamber of the third molar and the entire posterior half of the crown.

The dark oblique line under the third molar in No. 14 is the inferior dental canal, which in the region of the third molars is quite close to the apices. Root-ends of mandibular molars often appear to extend into the canal itself when in reality they lie either buccal or lingual to it. This effect, of course, is produced by the superimposition of one structure upon another in the path of the rays.

One of the chief difficulties encountered in the interpretation of films of an edentulous mouth is due to the lack of familiarity with the appearance of the jaws when the usual dental landmarks are absent. Even experienced roentgenographers frequently err in mounting films of an edentulous series, thus demonstrating clearly that they are unable to identify the anatomic structures because of their failure to recognize landmarks.

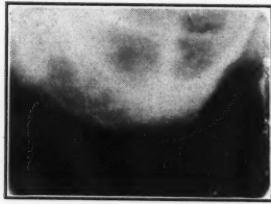
In a properly exposed series the occasions for such errors are extremely rare if the observer knows his anatomy, especially since every region in the maxilla and mandible, excepting on rare occasions the mandibular canine, has its characteristic identifying structures. In the accompanying series, Fig. 2, this statement is easily borne out.

In studying an edentulous mouth under the x-ray there are to be noted three great factors wherein it differs from the mouth containing teeth:

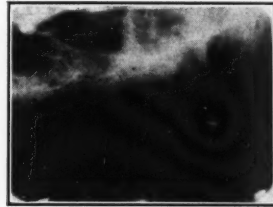
- (1) Following the extraction of the teeth the bony septa, as well as a portion of the adjoining alveolar process, become resorbed. In old age this condition has advanced to such a marked degree that only the more compact areas of bone remain. The amount of this resorption can be appreciated by



FIGURE 2—UPPER



No. 1



No. 2



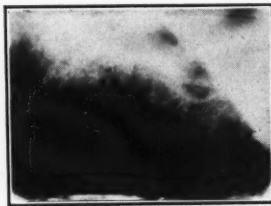
No. 3



No. 4



No. 5



No. 6



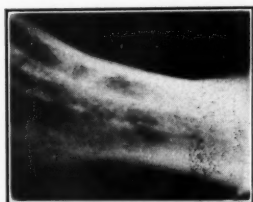
No. 7

comparing the thickness of the bone of the maxilla in the central incisor region in Figs. 1 and 2. The distance from the anterior extremity of the nasal septum to the alveolar ridge can be seen to be considerably less in the edentulous mouth, allowing for the change in the angle, necessitated by the more horizontal plane of the film when teeth are absent.

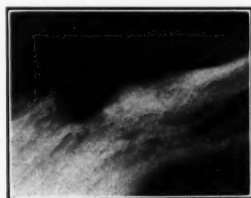
(2) Unless a part of the jaw has

been without teeth for a great number of years, a small portion of the alveolar process will remain unresorbed. This bone, however, is cancellous in structure and is therefore more radiolucent than the adjoining compact bone. As a result, the tendency is to overexpose or overdevelop the radiolucent areas. Accordingly, when looking for sharp pieces of process, sequestra, broken roots or any other objects which might

FIGURE 2—LOWER



No. 8



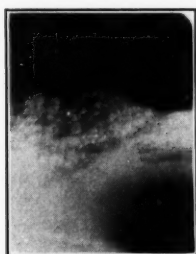
No. 9



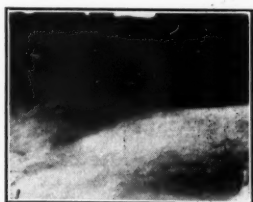
No. 10



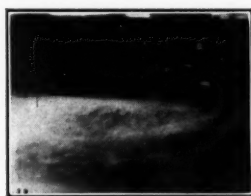
No. 11



No. 12



No. 13



No. 14

lie just under the soft tissues, the operator must be aware of the ease with which the region along the crest of the alveolar ridge is penetrated by x-rays and so govern his exposure and developing as to allow for this abnormal radiolucency.

(3) The third point of differentiation is not one relating entirely to anatomy, but should be included at this time. Because of the great loss of bony

substance as well as the teeth, the angle at which the films rest against the soft tissues, particularly in the maxilla, is such that unless the roentgenographer is observant and raises the angle of his tube, a great amount of distortion will result. This is particularly noticeable in the maxillary molar region and frequently presents a very vexing problem, especially since the malar shadow is superimposed directly on the molar area

if the tube is raised to compensate for this distortion.

The position of the structures within the nose and of the antrum as well as the superimposed shadows of the malar bone and coronoid process may be easily identified in Fig. 2, following their description in Fig. 1. It is particularly interesting to note that, as a result of the previously mentioned resorption of the alveolar process, the shadow of the nasal cartilage and also the radiopacity of the nostrils may be readily discerned in the film of the edentulous maxillary incisor region; in fact, the entire lower rim of the soft tissues of the nose is to be seen on the original negative. This is due not so much to the angle at which the expos-

ure was made as to the excessive resorption of alveolar bone. The same is true in the molar region, where, even though the angle in Fig. 2 had to be raised because of the flatness of the vault, by comparing it with the corresponding region in Fig. 1 the loss of cancellous bone is apparent. In the mandible this condition is particularly vivid in the bicuspid regions, where, due to the ravages of time upon the bone overlying it, the mental foramen has apparently moved upward from the region of the apices of the bicuspids almost to the senile ridge. This, incidentally, may sometimes be the cause of pain along the ridge after an individual has worn a denture for a number of years.

597 Fifth Avenue



#### [DENTISTRY TOO MECHANICAL]

*What a tragedy it is that the field of operative dentistry has been allowed to narrow down to a discussion of the various types of casting apparatus for the production of better inlays. We read many articles on the wax pattern, casting in a cold mould or a hot mould, investment materials, etc., but seldom do we read an article on the care of the deciduous teeth or the modus operandi for the operative procedure in the case of a child four years of age, with many broken-down teeth.*

—TASSMAN.

## Dental Caries and Pyorrhea\*

### ANOTHER APPROACH

By F. W. BRODERICK, M.R.C.S., L.R.C.P., L.D.S.

#### SIXTH ARTICLE

Having considered the prevention of dental caries, let us now turn our attention to the prevention of pyorrhea. We have seen that the exciting cause of this condition is the deposition of subgingival tartar in the sulci around the necks of the teeth, and that the physical signs of the condition with which we are so familiar are brought about by direct irritation, the infection at these situations being by the ordinary microorganisms that inhabit every mouth. The principal object, therefore, in the prevention of the condition will be the prevention of the deposit.

Although my argument is built up around the antagonism between the two conditions, caries and pyorrhea, stressing the fact that the former is the result of a condition of acidosis and the latter of a condition of an alkalosis, it must be remembered that there exist certain differences in the manner in which they are brought about. Caries, I would suggest, results directly from an alteration in the reaction of the saliva, which itself is a direct consequence of an attempt at compensation of the acidosis; whereas, in the case of pyorrhea, the alteration in the reaction of the saliva is not in itself the cause of the condition, although it so happens that this is responsible for the hypercalcification of the enamel which gives the immunity to caries, and demon-

strates the antagonism between the two conditions. There is here another factor that we have to take into consideration, which also is a result of an attempt at compensation, a physiological reaction, mark you, a consequence of the difficulty which the individual experiences in sufficiently adapting himself to his surroundings, which, although it permits life to proceed, does so at a certain cost and brings about a pathological result. We have, indeed, in the reaction of the saliva an index of the changes which are going on which is of the greatest importance in arriving at a diagnosis of the condition in its earlier stages, before the signs are sufficiently well developed to stand out prominently, and this is the time when preventive measures can be undertaken with the greatest satisfaction.

I would once more remind my readers of two cardinal points which have been mentioned in previous papers, and which are of extreme importance, viz., (1) that the presence of pockets, which are the direct result of alveolar destruction without that of the gum tissue, does not in any way imply that the causes of the pyorrhea are still active; it simply shows that at some time or other these were present; and (2) that figures arrived at as the result of an estimation of salivary reaction must be considered in relation to all the circumstances of the case.

In the visualization of the etiological factors that I have put before you I

\* Reprinted from *The Dental Magazine and Oral Topics*, December, 1929.

have stressed the fact that the irritation of the gum margins is the primary circumstance, and that the infection is secondary and of no importance in the absence of the other. This does not imply, however, that in the treatment of the condition the matter of the infection can be altogether lost sight of, for its presence is a constant reminder of the fact that, given pockets in the mouth, which is normally a septic cavity, no amount of cleaning of these will be of any avail; they will simply become reinfected in the same way in which they did originally. Consequently all lines of treatment which are built up on the assumption that pyorrhea is primarily the result of an infection are doomed to failure, so long as the pockets remain in being. Their complete eradication, and nothing short of this, must be the goal. I do not propose, in this place, to deal with the methods by which this may be done, other than to say that in my hands the diathermic cautery gives the best results where the pockets are of any depth. With its aid these can be removed throughout their whole depth, that is, to the free edge of the damaged alveolus, and the necks of the teeth laid bare and clean, when the patients start once more with healthy mouths, with no areas left for reinfection and with satisfactory gum margins just so much removed from the normal as was the depth of the pocket. The pyorrhea may then be said to have been cured.

There remains, however, by far the most important part of the treatment to be accomplished, for, should the patient still remain in the same state as formerly, that is, with a tendency to an alkalosis, compensation will take

place, and in the process a further deposit of subgingival tartar will occur, which will start the whole matter over again. Preventive treatment, therefore, must be undertaken with a view to removing this alkalosis or of so arranging matters that the compensation can be brought about without resulting in this deposition.

We have seen that a variety of conditions is responsible for the production of an alkalosis, when circumstances are favorable, and I must now refer to one or two. In a condition of anoxemia there occurs an attempt on the part of the blood to rid itself of a surplus of calcium salts resulting from a diminution of carbon dioxid. One of the causes of such an anoxemia will be residence at high altitudes. That there is a relationship between this condition and pyorrhea is suggested by the work of Moody, published in *The Journal of the American Dental Association* in October, 1928. This observer, examining the skulls of prehistoric Peruvians, found evidence of extensive pyorrhea and but little of caries (a circumstance which will now be understood). The *British Dental Journal* commenting upon these findings says, "So little is known of the dietetic habits of these people that it is useless to conjecture as to the reasons of this prevalence." This remark not only underlines the limited outlook of dentists seeking an answer to our problems, who can see nothing of importance in the lives of men other than that of the kind of food that they eat, but is, in addition, not strictly in accord with the facts, for we have in the writings of Prescott a very full account of the lives and dietary of the aboriginal inhabi-



tants of Peru. This historian states, *inter alia*, that agriculture was the most important industry at the time of the conquest, and that along the narrow strip of low-lying land along the coast the banana was the chief article of food grown. He goes on to say that as the land rose along the lower slopes of the Andes the banana faded from the landscape, and a substitute was found in maize, the great agricultural staple of both Northern and Southern America. Higher up the slopes of this mountain range, beyond the limits of the maize and quinoa (a grain bearing some resemblance to rice), was found the potato, the culture of which was continued in equatorial regions to a height which reached many thousands of feet, about the limits of perpetual snow in the temperate latitudes of Europe.

#### DIET OF THE ANCIENT PERUVIANS

Prescott further states that, although the Incas added to the fruit and cereal diet quantities of meat, the diet of the poorer classes, of whom the vast majority of the population was composed, consisted only of charqui, or dried meat, the product of the periodical hunts organized by the governing classes, and that it was forbidden, under pain of death, to kill animal or bird for food.

Consequently it will be seen that the staple diet of the vast majority of the Peruvians was one of cereal helped out in the more low-lying districts with fruit. From the point of view of Mrs. Mellanby's work such a diet would be considered unsatisfactory, in that it would be short of Vitamin D and rich in anti-calcifying substances, and it

would be none too good from my present standpoint, first, because of a shortage of mineral constituents and, secondly, because the end-products of metabolism would be acid. Nevertheless there is found a marked absence of dental caries, and I would therefore have you notice this: that, as the fruit in the diet gets less—until it would seem to have disappeared altogether—and the proportion of cereal increases, we find the inhabitants living at greater and greater altitudes.

Now, Prescott states that, with the exception of a narrow strip along the coast, which is, at its widest, only some sixty miles, the country rises steeply as one passes inland to the enormous Cordillera of the Andes. We know that at the time of the conquest the majority of the settlements were in the mountains, and that the vast proportion of the inhabitants, therefore, were living at great altitudes, and consequently any tendency to an acidosis (the result of diet) would be compensated for by a tendency to an alkalosis (the result of geographical circumstances) in those whose diet was deficient in fruit—a very wonderful effort of nature to balance matters.

#### THEORIES FIT THE FACTS

This environmental circumstance would, according to my visualization of affairs, account for both the absence of caries and the prevalence of pyorrhea as no other suggestions as to causation would seem to do. For, although the acclimatization of these people to the conditions under which they lived would be more or less perfect, this itself is brought about, as pointed out by Haldane—who studied

the phenomena in this very situation—by striking a balance between the desire for oxygen on the one hand and the need for the preservation of carbon dioxide on the other, which would result in a mild tendency to an alkalosis.

This reading is supported by a statement of Schoeman's, who says that in South Africa the inhabitants of the coast towns possess bad carious teeth with but few instances of genuine pyorrhea, whereas those of the great tableland of the Karoo have sound teeth combined with a great amount of gingivitis and pyorrhea.

#### CONDITIONS IN TRISTAN DA CUNHA

If we compare these findings with those of the dental conditions of the inhabitants of the island of Tristan da Cunha at the present day, we find some interesting confirmation. These people, living an isolated life, away from the effects of civilization as we know it, present a clean-cut experiment on the relationship between environmental conditions and dental disease. Dr. Marshall, the medical officer of the *Discovery*, examined a number of these peoples' mouths and once again found a remarkable absence of caries combined with a great prevalence of pyorrhea. In his report a great deal of stress is laid upon the diet of the islanders, which would seem to consist mainly of potatoes, helped out with some fish and the flesh of birds, there being a shortage of flour, jam and tea. This report was hailed as very distinct evidence of the truth of the teachings of Sim Wallace and of the destructive power of prepared carbohydrate food-stuffs, on account of their physical properties, but it will be obvious that

this circumstance will not account at the same time for the prevalence of pyorrhea, which, according to the "localists," is also due to the stagnation of carbohydrate food around the necks of the teeth. If it is taken as a proof of the one, it definitely disproves the other. Considering the matter from the point of view of these articles, I would suggest that the metabolic end-products of the potato, which work out at 8.6 basic, as compared with those of white bread at 3.7 acid, sufficiently account for both findings.

#### CARBON-MONOXID POISONING

Another manner in which an anoxemia may be brought about, and which, therefore, becomes a cause of an alkalosis, is by carbon-monoxid poisoning. In this condition it is not that there exists a shortage of oxygen in the air breathed, but rather that there is a difficulty in transporting it to the tissues. Carbon-monoxid has a great affinity for hemoglobin, with which it forms a substance which effectively prevents the union of oxygen with hemoglobin, and every corpuscle which is damaged in this way becomes, for the rest of its existence, useless as a carrier of oxygen. And, until it is replaced, the blood is, by that much, less efficient for this purpose.

Here, as in the consideration of anoxemia from high altitudes, it is not the acute cases which are of interest to us, but the quite mild ones, where the results will be similar, if less pronounced. When we remember that this gas is always the result of incomplete combustion, we see that there must exist a considerable amount in the atmosphere of towns, in these days of gas

fires and petrol engines, and Henderson and Haggard have found it in perceptible amounts in the air of New York.

#### EFFECT OF SMOKING

Further, Dixon found that the CO concentration in a confined space after intensive smoking rose to 0.01%, and Hartridge estimated that there is 6% of CO in the blood of a cigarette-smoker. He points out that a healthy man does not show symptoms of poisoning until 15% to 20% of the hemoglobin is fixed and put out of action, and consequently it is probable that many of us are suffering from a mild anoxemia from this cause without any knowledge of the fact.

#### HYPERCHLORHYDRIA

In addition to the danger attending the inhalation of carbon-monoxid, smoking, through the action of the nicotin on the vegetative nervous system, is productive of an increase in the secretion of the gastric juice, and Hurst believes that this is one of the most frequent causes of hyperchlorhydria, a matter that I now want to consider.

I pointed out in my last paper that in a condition of achlorhydria the absorption of calcium salts was interfered with, this being only possible in an acid medium. In a hyperchlorhydria, therefore, this absorption will tend to be augmented, which will militate against the appearance of an acidosis. There exists, however, another circumstance in connection with the secretion of the gastric juice which affects the situation, viz., that, as this is dependent upon the splitting-up of a salt—the acid ion passing into the stomach and

thus becoming lost to the blood, leaving the basic ion behind—the blood balance is lost, and, for a time at least, an alkalosis comes about. Any condition, therefore, which results in a hyperchlorhydria will tend to produce an alkalosis and, I suggest, pyorrhea.

#### GASTRIC ACIDITY

Let us see if there is any evidence of the coincidence of the two conditions. There would seem to be an idea prevalent among dentists that in patients who suffer from an "acidity" of the stomach the teeth are particularly free from caries. Now, acidity of the stomach is in reality a condition of hyperchlorhydria and consequently not, from a biochemical point of view, acidity at all, but rather, as we have seen, a tendency to an alkalosis. I have never seen any figures bearing on the point of immunity to caries in these circumstances, but Tyree has gone into the matter of the connection between hyperchlorhydria and pyorrhea and believes that the former is an etiological factor in the production of the latter, which would support the belief. Sagal, who has reviewed Tyree's work and done some experiments along the same lines, says, "The fact that there is a greater proportion of patients with pyorrhea having gastric acidity and, conversely, a greater proportion still of patients with gastric acidity having pyorrhea suggests that it is advisable to have a gastro-intestinal study on patients with pyorrhea."

#### SUGGESTIVE RESULTS

Although Sagal is unable to trace a definite relationship between the two conditions, the figures given in his

paper are very suggestive that it exists, though, perhaps, not quite in the way that he expected to find them, not realizing that the pyorrhea was not so much the result of the hyperchlorhydria as of the alkalosis to which it gave rise. Understanding this, we see that it would be unreasonable to expect all cases of pyorrhea to show evidence of hyperchlorhydria, in that this is but one cause, and not the most important, of an alkalosis.

In addition to these causes, which are used here simply as illustrations, there are other conditions which may result in the production of an alkalosis, if and when the constitution of patients is such that in normal times their tendency is in this direction. In considering a hygienic regime for these individuals for the prevention of pyorrhea all these circumstances must be taken into view, remembering that our object is to balance alkali with acid. This can be done either by increasing the acid formation or by an attempt to limit the production of alkali.

#### DIET AND EXERCISE

Here, to some extent, an alteration in the diet may be indicated, reducing those foodstuffs which give alkaline end-products and increasing the acid-forming ones, cutting down the potato and increasing the meat, if not otherwise contra-indicated. In addition, more exercise may be required. We have seen, when considering the prevention of caries, that excess acid can be formed by strenuous muscular exertion, and at the time of life when pyorrhea is most common (and I particularly stress the point that I am only considering this condition as defined in

my last paper) it is usual to find that the amount of exercise that is taken is considerably less than in former times. Without undue difficulty this may be considerably augmented. Walking to the office in the morning instead of using the car, or an additional round of golf in the week, may be all that is required to balance matters. This change in the daily routine will be recognized by the patient as being beneficial to general fitness, in addition to the condition with which we are primarily concerned.

Haldane's suggestions on the secretion of oxygen inward from the lung epithelium into the blood is of considerable interest in this connection. He believes that in times of stress, such as would be present in a mild chronic anoxemia resulting from an indoor life, the cells of the lung alveoli have the power of passing oxygen to the blood at a greater pressure than it exists in the air breathed. This would to some extent overcome the difficulty of obtaining oxygen and tend to prevent overbreathing with its loss of  $\text{CO}_2$  and the attendant alkalosis. It has been shown by Briggs, however, that this power is dependent upon physical fitness and will be much more in evidence when one is in reasonable training than when one is out of condition.

#### PSYCHOLOGICAL UPSETS

I have already discussed the matter of psychological upsets and their sequelae of increased alkali absorption through suprarenal stimulation. These must receive consideration and be regulated where possible. In these cases also, the increased exercises just suggested, in addition to providing excess

acid to balance the increased production of alkali, will act physiologically by consuming the products of excessive gland activity and prevent the damage that this would entail.

In many cases, however, it will be found that, notwithstanding these attempts to regulate the circumstances of life, the difficulties which civilized existence bring about will necessitate other measures being taken, and in a similar manner to that which we have seen was necessary in combating caries an additional amount of acid must be administered.

The necessity for this and the amount that must be given can be arrived at only through a number of estimations of salivary reaction, it being remembered that the results of these estimations must be considered in relation to all the circumstances of the case.

There are certain difficulties in administering acids that do not exist in the case of alkalis, and in the first place it is important to remember that the powers of the body in eliminating excess of acid are not so complete as in the case of alkali. This fact accounts for the circumstance that acute attacks of alkalosis are nothing like so common as are those of acute acidosis. In fact, as I stressed when considering the administration of sodium bicarbonate, the body can deal with an almost unlimited amount of excess alkali, whereas much smaller amounts of excess acid can have very serious results.

#### COMPENSATION BY NEUTRALIZATION

It might at first sight appear from this that a chronic alkalosis was not

an important matter, if the eliminative powers of the body can so easily deal with the alkali; but, as I have tried to explain, it is in the elimination itself that the damage to the teeth and their supporting tissues arises. Consequently, our efforts, where we cannot avoid a surplus, should be to bring about compensation by neutralization, so that compensation by elimination is avoided.

From all this it follows that, before attempting neutralization of excess alkali by the administration of additional acid, it is very essential that we are certain that the addition is required, that is, that an excess of alkali is really present. It is for this reason that I have stressed over and over again that the presence of the signs of pyorrhea, the gingivitis, the pockets, the alveolar destruction, and possibly the pus, does not imply that the cause of these signs, the alkalosis, still exists. If this does not happen to be present, then the administration of additional acid may be a very dangerous procedure.

#### THE ACID OF CHOICE

The simplest method of administering acid in these circumstances is by giving the acid salt, ammonium chlorid, rather than a strong acid like hydrochloric, which, except in very dilute solution, would be difficult to take. It must be remembered that the weak acids, such as citric, are metabolized as alkalis, in that they unite to form alkaline salts with the strong bases, sodium and potassium. Ammonium chlorid splits up into ammonia, which is excreted from the body as urea, the acid ion remains and, passing into the blood, provides acid to neutralize the excess of base.



With regard to dosage and times of administration the same rules as those given for sodium bicarbonate hold good. The quantity to be given must be arrived at by considering the amount of alkali to be neutralized rather than the age of the patient or the dose given in the pharmacopeia, which may be either too high or too low for the case in question. For the purpose for which we require the ammonium chlorid and the amount to be prescribed, the salivary index will form the guide, as soon as we have made up our minds that we have a reaction which represents the normal for the individual patient unaffected by adventitious circumstances. After the patient has taken this dose for four or five days, it will be necessary again to estimate the reaction of the saliva to see the effect of the drug, when the amount can be either increased or diminished, as seems wise. I usually start with about two grains, or as much as will lie on a sixpence without being heaped up. This latter method of estimating the amount does away with the necessity of getting a chemist to weigh out each dose. It also enables the ammonium chlorid to be bought in bulk, say, an ounce at a time, and the dose slightly increased or diminished as ordered.

By this method, exercising a little care and thought, combining medical treatment with attention to diet and hygiene, a state of acid-base balance can be arrived at which will effectually prevent an alkalosis. A certain amount of intelligence on the part of the patient is, of course, necessary to regulate matters. For instance, where exercise is increased and additional acid provided in this manner, less ammo-

nium chlorid will be required, and so on. It is advisable, therefore, to explain the rationale of the treatment to the patient so that he may contribute to its success.

#### ON AN EMPTY STOMACH

Ammonium chlorid, also, must be administered on an empty stomach the first thing in the morning, so as not to upset the acidity of the gastric secretion. The reasons for this are the same as those given in the case of sodium bicarbonate.

If the pockets have been destroyed, the necks of the teeth carefully and completely scaled, and the dose of acid satisfactorily arrived at, there should be no further deposit of subgingival tartar, and the return of the pyorrhea will have been prevented. In practice, however, it will often be found that this pitch of perfection will not be reached on account of the difficulties of estimating beforehand all possible upsets of metabolism and of taking precautions accordingly. It will be advisable, therefore, to keep in touch with the patient and at regular intervals to examine the teeth for calculus and scale when necessary.

One other circumstance must be remembered, viz., that alterations in the general health may profoundly modify the tendency to an alkalosis, which would, of course, alter the necessity for treatment in this manner, e.g., an attack of influenza, in which case there might even arise a temporary tendency to an acidosis, the result of the fever or subsequent debility, when to give an acid substance like ammonium chlorid would be fraught with danger. The patient should be warned, therefore,

that it would be as well when feeling "out of sorts" to give up the powders until he had recovered.

The preventive treatment of caries and pyorrhea sketched out in this and the preceding paper follows rational lines, if we accept the arguments advanced and the visualization presented of the causes behind those conditions. In addition, they have the advantage of being reasonably possible of performance, which so many of the suggestions put forward by the "localists" fail to be.

It has often been said that there is not one single cause for all cases of dental caries, but that a very large number of circumstances play a part. The many theories at present in the field which attempt to account for this condition, each seeming to be satisfactory for some cases but failing in others, give some semblance of truth to the suggestion. Yet it is hardly likely that the same pathological change can be brought about in such a variety of ways, unless each of these acts in a similar manner; in other words, that there exists a lowest common denominator of all these factors, and this is what, in reality, my suggestions amount to. Whether it be an unsatisfactory diet that is blamed, a change in reaction of the saliva, changes in the secretions of the ductless glands, hereditary or constitutional conditions, alterations in tooth structure, deficiencies in Vitamin A, D, or C, changes in general health, climatic conditions, excess vitality, or bad hygiene, all and every one of these circumstances can be shown to act by an upset in the acid-

base balance of the blood, bringing about in its compensation just the conditions that I have described, which will, of necessity, be followed by those states which may be expected to cause tooth destruction.

The reason that circumstances which in some instances are productive of harm seem in others to have no bad effect is that the matter of diathesis comes into the equation, the position of the normal balance before the stress begins to act. If this is near the borderline, a small stress may have a bad effect; if further removed, the stress must be much greater; and, in addition to this, there may happen to be other environmental conditions which are acting in an opposite direction, as illustrated by the circumstances of the ancient Peruvians.

With regard to the etiology of pyorrhea, the misleading name would seem to have led us all astray, a "flow of pus" stressing the infection which, in the enthusiasm of the nineteenth century among the enormous advances following on the work of Lister, blinded us to the other circumstances on which the infection primarily depended and so focused attention on the gingivitis, which is but part of the trouble, until we were unable to differentiate one condition from another and lumped them all together under this description.

If we disentangle these and separate out the clinical entity which we are really considering, I believe that all difficulties disappear and the etiology becomes plain.

## Immediate Full Upper Denture Service

By FRANK C. FURNISS, D.D.S., Columbus, Ohio

In almost every case it is advisable to insert dentures as soon as possible after extraction. There are a number of reasons why this is good practice. The patient requires occlusal rest. The maxillary ridge needs protection and retention. Also, esthetics and enunciation must be considered. Few people like to appear before others without teeth, and the demands of modern business and society make it difficult and embarrassing for them to do so.

In order to handle these immediate cases successfully, the upper denture must be finished and inserted on the same day the teeth are extracted. But this practice presents difficulties unless certain precautions are observed.

The following plan, which the writer uses, eliminates much doubt as to results:

First, secure compound impression of the upper before extraction and make a study cast. Of course there are cases where this is useless, but where enough whole teeth remain it helps to guide us in the assembling of the artificial teeth. Cleanse the natural teeth and observe colors particularly. You will find that colors vary in the same mouth. Arrange an early morning appointment for the extraction. Block anesthesia is to be preferred. Extreme surgical preparation is not recommended, but careful preparation is necessary. If sutures are inserted, they should be few, with the ends of the sutures cut close. When the hemorrhage stops sufficiently, and while anesthesia is still effective, take a

good snap impression in modeling compound. Pour a plaster model and closely adapt a baseplate to the model and trim for peripheral adaptation. Insert this trial baseplate in the mouth carefully, using retention powder if needed. Have the patient wear this baseplate from the time it is inserted until the denture is finished, removing it only for necessary fitting of the denture. Now duplicate this baseplate and proceed to build the bite rim in wax. Remove the first baseplate and insert the second to develop the bite width and occlusal plane. Remove this, dry it thoroughly, apply impression material, and take the impression in this baseplate according to directions. When it is adapted to position in the mouth, have the patient close to contact and allow it to remain until set, after which remove the surplus plaster and have the patient rinse the mouth to wash away fragments. Mark the median line. Now form a roll of very soft beeswax, dry the bite rim in the mouth, fix this roll of wax to the bite rim, and have the patient close the mouth in centric occlusion. Seal the beeswax to the occlusal rim, chill, have the patient open the mouth, and proceed to remove the impression carefully. Replace the temporary baseplate in the mouth and allow this to remain while working on the denture.

You now have the impression and bite in one unit, and you can proceed to pour the model with model plaster (not stone), mount on the articulator, set up the teeth, try in and finish.

Without the use of the temporary baseplate there is usually so much swelling that adaptation is interfered with and the denture cannot be tolerated.

by the method outlined is greatly appreciated by the patient, and a favorable psychological effect is evident the instant the new denture is inserted.

The protection of the tissues afforded

327 East State Street



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## Filipino Students Pay Their Last Tribute to Their Beloved Friend, Dr. L. L. Barber

By WALLACE A. KAWI

We Filipinos here in Toledo were immeasurably shocked at the sudden death of Dr. L. L. Barber on November 23, 1929, because the comforts of his house had always welcomed the incoming students from the Philippines. We feel the loss of that beloved one deep in our hearts, and therefore consider it our paramount duty and obligation to extend our profound sympathy to all the members of his family still in sorrow. His death, to the writer, who lived with him for three years, observing the indelibility and integrity of his perspicacious vision and personality, is far greater than one could fancifully imagine, because it was his altruism and blissful responsi-

bilities that inspired me to climb the heights of a college education in this land of boundless opportunity.

Now he is gone! But the fragrance of his kindness, uprightness, manliness, unselfishness, unmarred by racial prejudice, will linger in our memory as blessings for time immemorial.

(Signed) Lucian Choñgait,  
Laurence Falaweg,  
Jerome Fatongkeg,  
Claudio Omaoeng,  
Satero Walwal,  
Donald Afidchao,  
Albert K. Banglat,  
Pedro Patago,  
Wallace A. Kawi,  
Chairman.



## The National Dental Survey

The active work on a national survey of dental income began in December, 1929, in Chicago. This study aims, through a discovery of the significant facts of the situation, to throw light on some of the major problems facing the dental profession today.

For the first time in the history of dentistry in this country the profession is really seriously attempting on a large scale to find out the facts about its economic problems and their relation to larger community situations. The American Dental Association is directing this study and has appropriated the funds for carrying it through.

The survey is to be made by means of a very interesting and significant questionnaire, which is to be mailed to every fourth dentist in the greater part of the United States. Some of the important questions on this questionnaire relate, for example, to the charges for specific services, the number of patients treated, the income groups to which the patients belong, the gross and net incomes of the dentist, his methods of collecting fees, and his policy with regard to charging fees according to the economic status of the patient. In short, the survey is attempting to discover whether the dentist is receiving an adequate return in view of the hours worked, what proportions of the population are receiving dental care, and the structure and functioning of dentistry with relation to the social whole.

The exact form of the questionnaire to be sent out was very carefully con-

sidered at two meetings held in Chicago on December 13-14, 1929, by Dr. Herbert E. Phillips and Dr. C. E. Rudolph, of the committee of the American Dental Association for conducting this study; Dr. N. Sinai, of the Committee on the Cost of Medical Care, and twelve advising Chicago dentists. After its approval by the other members of the committee of the American Dental Association this questionnaire will be mailed to every fourth dentist in the greater part of the United States.

The American Dental Association is fortunate in having the assistance of the staff of the Committee on the Cost of Medical Care in conducting this study. Dr. Sinai, of Ann Arbor, has been particularly active in assisting in the program laid down by the dental committee. The results of the study are to become the property of the American Dental Association, but are to be available for reference by the Committee on the Cost of Medical Care. A small clerical staff is beginning work in quarters provided by the Association, and the careful assembly of data from the states of Illinois, New York, Indiana, Minnesota, California and Pennsylvania will begin at once. When this is completed, the work will be extended to the remaining states.

The national dental committee appointed by the American Dental Association to conduct this survey is composed of Dr. Herbert E. Phillips, Chicago, Chairman; Dr. C. E. Rudolph, Minneapolis; Dr. R. E. Denny, Philadelphia; Dr. H. J.



Leonard, New York; and Dr. Guy S. Millberry, San Francisco.

The American Medical Association is likewise studying the economic facts of the medical profession and is collecting similar data with reference to income and fees charged. These projects are all to form a part of the much larger survey now being conducted by the Committee on the Cost of Medical Care. This committee was organized about two years ago and is under the able leadership of the Secretary of the Interior, Dr. R. L. Wilbur, Chairman, and Dr. Harry H. Moore of Washington, D. C., Director. This study is attempting among other things to ascertain such facts as the cost of illness to the average family, the fees of the medical and dental practitioners, the cost of medicines, drugs and appliances, and the incidence of disease and disability and the facilities available for dealing with them.

At the first meeting of the committee in Chicago the seriousness of the undertaking and its tremendous significance to the profession and to the American public were pointed out. The movement that the American Dental Association

was beginning was considered one of the most urgently needed and most discussed in the history of the profession. It was anticipated that the results would be of immense benefit to the public, the dental practitioner and the professional organization. Its need and merit were thought to be so obvious that one hundred per cent cooperation could be expected from those asked to help.

The spirit of the whole undertaking is that of fact-finding. The study attempts to be scientific and has no other interest than the discovery of the truth. The schedules are to be kept strictly anonymous, and there will be no possible way of discovering the source of the individual data contributed. *The schedules are not to be signed, and the identity of those who fill them out will never be known.* The contribution that each dentist will be making to the future welfare of his profession by giving adequate time from his busy practice to filling out the schedule accurately and conscientiously cannot be overemphasized.

HERBERT E. PHILLIPS.



## Joint Meeting of Physicians and Dentists

The medical societies of the counties of Kings and Queens and the Second District Branch of the Dental Society of the State of New York will hold a joint meeting on March 10, 1930, in recognition of the marked extension of the fields of practice common to medicine and dentistry witnessed by the past decade and to promote the growing need for a closer relationship between the two professions. The meeting will be held in the building of the Medical Society of the County of Kings, 1313 Bedford Avenue, Brooklyn, N. Y.

For this occasion there is being gathered from throughout the country the best available talent, so as to present to the physician and to the dentist various important phases of medical and dental interdependence and opportunities for coordinating their common interests. A medico-dental meeting on such a large scale is pioneer in character and, it is believed, will do much for the progress and development of the interrelationship of the professions.

The immediate future will surely witness a more intimate relation of medicine and dentistry and an extension of cooperative movements which promises to become national and even international. We should look forward not only to joint meetings of local medical and dental societies as a regular occurrence but to such meetings of state medical and dental organizations, and even of the American Medical and

Dental Associations. With such a meeting of these Associations in 1933, it is not too much to look forward to an International Medical and Dental Congress in New York in 1935 or 1936.

The effect of such a cooperative movement upon the practice of medicine and dentistry both in this country and throughout the world will be most profound and far-reaching and will benefit countless millions by the better service each of the professions will be enabled to render.

A cordial and urgent invitation is extended to all practitioners of medicine and dentistry to attend the meeting called for March 10th to arouse the interest and set into operation the activities of local, state, national and international medical and dental organizations along cooperative lines.

### PROGRAM

- 3:00 P. M. *The Cooperation of the Physician and Dentist in the Recognition of Disease.*
- 4:00 P. M. *What Justifies the Dentist and Physician in Advising the Extraction of a Tooth?*
- 5:00 P. M. Social hour.
- 6:00 P. M. Dinner.
- 8:30 P. M. Scientific Session: *Oral Conditions and General Health.*

## DIGESTS

### DRY SOCKETS

By MORRIS A. ZIMMER, D.D.S.

According to the author, the dry socket is a misnomer. It is a sloughing necrotic socket with raw, frayed edges and the contents are of a dirty gray color. There is a lining of dead bone that prevents the growth of healthy granulation tissue.

The primary causes are given as excessive trauma during extraction, pressure during the infiltration of novocain, preexisting osteitis, the burnishing effect when a pulling force is used in the removal of hypercementosed roots, septic infection, contamination by the patient, and a tight packing instead of a light dressing.

Secondary causes may be the extraction of teeth during menstruation, poor resistance of the patient, diabetes, lues, or one of the anemias, in which case no healing will occur until systemic treatment has been instituted.

Palliative treatment is by the use of escharotics, trichloracetic acid or aromatic sulphuric acid.

Prevention may be helped by touching the apex of the socket with 95% phenol followed by alcohol when non-vital teeth are extracted. All spicules must be removed and gauze should be inserted with no pressure. Aristol is of value, and the use of a sedative before and after extraction should be a routine procedure. The socket may need treatment for from two to ten days,

and, as a rule, the escharotic is used only once, followed by daily sedative dressings. If there is no definite improvement, then the escharotic should be used again two days later. This is rarely necessary.

If the sloughing bone is thin, it will be resorbed; if it is thick, there will be a true necrosis and the entire socket will be exfoliated. — *The Dental Cosmos*, December, 1929.

### PAINLESS, RAPID CURE OF PERIDONTAL ABSCESS

By A. L. SORESI, M.D.

The author presents this method, for which he claims the following advantages:

No anesthesia is required, an incision only between  $\frac{1}{8}$  and  $\frac{1}{4}$  of an inch is necessary, there is no after-pain, and the cure is rapid.

A clean, sharp-pointed scalpel is dipped in pure phenol (phenol crystals dissolved by placing the bottle in lukewarm water), and a very small incision is made over the point where fluctuation is most in evidence. The point of the scalpel is moved gently back and forth until the pus oozes out. The pus is not squeezed out and no drain is inserted.

The phenol on the blade makes the incision painless and also keeps the cut edges from adhering, consequently the pus will continue to ooze out and healing will start from the bottom. The

omission of drains prevents any irritation to the wound.—*Dental Items of Interest*, December, 1929.

## THE RELATION OF DIET TO DENTAL DISORDERS

By MILTON T. HANKE

While bacteria are probably involved in the production of dental caries, there are certain facts that make it hard to believe that the production of acid is the cause of this disease. It is probably due to the production of proteolytic enzymes.

Examination was made of 114 patients from six to 60 years of age. Seventeen were free from dental disorders, and eleven of these were on a diet containing an ample supply of vitamins. In one case, a boy of 17 years, the diet was deficient in vitamins, and the health was poor. The teeth, however, were excellent.

Forty-seven cases presented uncomplicated caries, and there was a marked deficiency in Vitamin C. Twenty-seven of this group were obtaining plenty of Vitamin D.

Twenty-five cases had caries associated with gingivitis or pyorrhea. None of these were deficient in Vitamin D only, but all were deficient in Vitamin C, and in fourteen of the cases this was the sole deficiency.

Twenty-five cases had gingivitis or pyorrhea without caries. The diets were all deficient in Vitamin C, and in fourteen instances this was the only deficiency.

The author does not claim any proof from the facts stated above, but believes that they suggest strongly that the importance of Vitamin D has been overrated, and that Vitamin C is an important factor in dental disorders.—*The Journal of the American Dental Association*, December, 1929.

## Foreign Dental Literature

Edited by JOHN JACOB POSNER, LL.B., D.D.S., New York, N. Y.

### ROOT - CANAL TREATMENT AND ITS RADIOGRAPHIC CONTROL

By DR. I. BEGELMANN, Head Assistant of the Dental Clinic, State University, Moscow, Russia

The injury to the peridental membrane in teeth which have had the pulp exposed or removed is more frequent in wide canals than in narrow ones. This is seen in the size of the periapical area of infection, which is larger in the palatal root of the maxillary molars or

the distal root of the mandibular molars. In roots with obstructed canals there still remains the question as to whether they should be enlarged through chemical or mechanical means.

The complete filling of the root canals with paste and sealing the apical opening are impossible in the majority of cases. Most frequently the canals are only half filled, even in the maxillary central incisors. In the really favorable cases three-quarters of the canal is filled successfully.

No success attended the attempt to show a connection between the root filling and the condition of the periapical area. It did not always follow that a well-filled root canal meant a healthy periapical area, and it was also true that teeth with poorly filled canals showed apparently normal periapical areas.

Radiographic examination of pulpless teeth and filled teeth which were clinically sound and functioning normally shows the following:

- (a) Teeth with pericementitis — 69% appeared normal in the x-ray.
- (b) Gangrenous teeth — 48% appeared normal in the x-ray.

Of the various methods of handling teeth with gangrenous pulps the Howe silver-reduction treatment proved best.

Natural resistance plays an important part in determining the etiology of granuloma.—*Zahnärztliche Rundschau*, November, 1929.

## THE GOAL AND POSSIBILITIES OF MODERN ROOT-CANAL TREATMENT

By PROF. DR. GUIDO FISCHER, Hamburg,  
Germany

The present discussion covers the treatment of simple gangrenous or pus-filled root canals where the peridental membrane is not acutely involved. The consideration of the periapical tissues does not enter here, as it does in pulpitis, because the apical area is now so greatly changed and necrotic that we cannot expect a physiological closure of the root canal. The pulp chamber is filled with necrotic and infected tissue, and there is direct communication with the mouth and with the peri-

apical tissues through the apex. One must be careful in effecting a passage through the canal, since acute conditions will be set up if any of the infected material is pushed through. In the beginning this infected mass of material should be disinfected and sterilized. In this country tricresol and formalin is most commonly employed for the purpose. In two treatments over a period of fourteen days disinfection should be complete and then the root canals can be carefully cleaned and widened. Even at this time care must be exercised so as not to force any of the material through the root-end. Finally the nerve broach removes the debris until the apex is reached.

Treatment of teeth with gangrenous pulps is difficult, complicated and not always successful. In acute cases the pulp chamber must be opened as soon as possible. It is only after the acute symptoms have subsided and the canal entered with disinfecting gases that relief is afforded. As a last resort, if the tooth does not respond, a root amputation may be performed. Root amputation is successful in 90% of the cases operated. The canal must be thoroughly disinfected and aseptically filled. If but the smallest part of the root harbors gangrenous material, it will result in the failure of the operation. Although root amputation is one of the most favorable and successful surgical procedures, it is not used so much as formerly, as the perfection in root-canal treatment has served to clear up infected apical area which heretofore depended upon surgical interference for eradication.

In the filling of root canals the

author quotes Kantorowitz on the advisability of carefully widening the canals, since easy accessibility means favorable canal filling. It is really the mechanical preparatory treatment that insures success. Fischer adjusts the rubber dam, washes out the canal with  $H_2O_2$  and then with alcohol. Above all things, he insists on flushing the canals thoroughly with alcohol preparatory to filling. The canal is then dried with sterile paper points until the points come out perfectly clean. Each point is introduced into the canal but once. The canal is then filled with cement which has been impregnated with iodoform, and into this a gutta-percha point is forced. In canals which formerly held gangrenous pulp it is best to incorporate into the root filling some substance which will give off formalin.

Prof. Fischer regrets that he is unable to go into many other of the methods of handling gangrenous teeth and refers favorably to the silver-reduction technic of root treatment and filling.—*Zahnärztliche Rundschau*, November 3, 1929.

#### ETIOLOGY AND THERAPY OF CHRONIC PYORRHEA ALVEOLARIS

By DR. HANS STURM, of Reichenberg,  
Delivered in Prague, February, 1929

All known metallic poisoning is produced by tin, bismuth, mercury, arsenic, iron, phosphorus, or gold. These cause a gingivitis in previously healthy gums. It is true that catarrhal gingivitis becomes aggravated through metallic poisoning. Prof. Lehman has produced acute pyorrhea with loss of teeth in young healthy cats by the administra-

tion of tin. Even if pus and swelling are present, treatment with mercury will also produce gingivitis with tendency to pyorrhea. It is thus shown that metallic poisons have special selectivity for the gingiva.

Colloidal gold produces severe gingivitis and kidney trouble. Phosphorus produces severe gingivitis with loss of teeth and necrosis. All of the poisonous metals affect not merely the gums but also the liver, spleen, alimentary tract and lymphatics. The fact that these tissues are the only ones affected is due to the long, striped capillaries which are found in them.

The blood flows more slowly in the capillaries than in the larger vessels. Contact is made directly with the capillary walls, which consist of a single cell. Here the exchange takes place between the blood and the tissue. It is in the capillaries that the poison in the blood becomes effective, and subsequently in the tissues around the capillaries.

The longest capillaries are found in the kidney, liver, spleen and thymus. Schweitzer has shown that they are also long and plentiful in the interdental papillae of the gums. The peridental membrane is especially rich in long, striped, interlacing capillaries.

The most widely known organic poison is alcohol. Among some of the effects of alcoholism are bronchitis and raw voice, and in chronic conditions the kidney and liver are involved. The principal interest for the dentist is catarrh of the mucous membrane of the mouth, seen mostly in the gums and tongue as a result of alcoholic poisoning.

Severe organic capillary poisons are also found in bacterial toxins. The



severest of these is general sepsis, and in such conditions the gums are tender and swollen, suffused with blood and often ulcerated. The tongue, with its tremendous richness in capillaries, tends to ulceration. The kidneys, intestines, liver and spleen are affected. Great importance is to be attached to the fact that for weeks after the infection has been clinically cured the microscope will still reveal distinct injury to the capillaries.

It must be evident, then, that the various capillary poisons, such as various metals and bacteria, produce a noticeable change in the capillaries and subpapillary plexus which are visible through the microscope and may be visible also to the naked eye in tissues rich in capillaries, especially of the long, striped, interlacing variety. A catarrhal condition of the gingiva may be observed clinically through a strong scaling off of the epithelium, edematous swelling and redness of the interdental papillae. This catarrhal condition may progress even to the falling out of sound teeth and is accompanied by pus from the alveolus. This is acute pyorrhea. It is a rare form as compared with the chronic variety.

People over fifty are particularly susceptible to pyorrhea, and 80% of them suffer from the chronic form of this disease. The question is that poisons cause this widespread disease. We can suspect the so-called autotoxin as the chronic toxin. Just how this originates is open to many opinions. The author believes that it is due to the fact that a surplus of food enters the alimentary tract, is not properly digested, and sets up autointoxication. Excess of albuminous foods is often

guilty. These toxic symptoms are illustrated by dizziness, pulse change, blood-pressure change, and finally by changes in the capillaries. A shining example of the effect of improper food on the gums is seen in scurvy.

Two students were chosen in order to carry out the experiments of the author as to the relation of diet to changes in the gum. They were kept on a meat diet for two weeks and then changed over to a milk and vegetable diet. The meat diet produced pain and bleeding of the gums. This condition of the gingiva disappeared when a milk and vegetable diet was adopted.

Overfeeding with albumin will cause injury to the capillary system, especially the gingiva. Excess of the carbohydrates, starches or fats also will injure the intestines. In all these cases there is a distinct change in the gingiva with a tendency to sore and bleeding gums.

It is the author's opinion that auto-intoxication is a prime factor in producing pyorrhea. A proper diet will help cure the disease. Fruit is excellent, and several apples a day should be eaten. Raw vegetables are suggested for the menu. It is sometimes several months before an improvement is noticed.

In conclusion, it is the opinion of this writer that the gingiva is an excellent indicator of capillary poisoning.—*Zeitschrift für Stomatologie*, October, 1929.

### CHLORIN IN ROOT-CANAL TREATMENT

By DR. A. KERBER, Prague

Every remnant of pulp left behind in a root canal is a danger, and this is

not prevented by mummification or antiseptics which have long-lasting qualities. It is not always possible to remove a pulp entirely, due to twisted canals, accessory canals or obstruction of the canal opening through various causes. It is therefore necessary to remove this remnant chemically.

At first 50% sulphuric acid was used for this purpose and was found insufficient, and then aqua regia took its place. Sodium bicarbonate was used to neutralize the excess. This, too, did not accomplish the desired effect. Sodium superoxid took the place of sodium bicarbonate. It was thought that the strong foaming which resulted worked in the depths of the canal in the apical region. It was thought that the chlorin and oxygen liberated removed the apical tissue that was present. After many years it was found that teeth treated in this manner became reinfected. The bubbling action of the drugs was confined to the superficial area, and the neutralization of the acid in the apical

two-thirds of the canal was accomplished slowly. As a result the apical pulp remnant was unaffected and disturbed, if at all, only by the nerve broach.

The correct method, according to the author, in clearing the canal is entirely different. Instead of putting aqua regia in at first, to be followed by the sodium superoxid, he first carries potassium chlorate into the canal and fills the canal with it loosely. A drop of aqua regia is then carried to the entrance to the canals. A strong reaction takes place with the formation of chlorin and foam. This is wiped away and the process repeated. The canal is wiped clear and dried carefully with paper points. A fresh drop of aqua regia is applied and the process repeated until the foaming has ceased. The canal is then dried, alcohol applied, and dried with hot air. The canal may then be filled.—*Zeitschrift für Stomatologie*, October, 1929.



# DENTAL ECONOMICS

## Social Adaptability

By S. J. HORN, New York, N. Y.

Intellect, emotion and volition are the three main faculties of civilized man. It is necessary that these capacities should be well balanced in order that the individual may live in perfect harmony with the established order of society. An overdevelopment of any one of the faculties, whether in an individual or in society, results in overthrowing the balance, because an overdevelopment of the one means an underdevelopment or dwarfing of the other one or two capacities. This is readily seen in any mathematical genius, who is all mind with little or no emotion or volition, or in our ancestral cave-man, who was a purely emotional and volitional creature with no intellect to speak of.

In the ranks of dentistry there are practitioners who always have been and still are brilliant students. You will find them participating in all post-graduate courses and other activities that will keep them in incessant search for more knowledge and greater technical skill. A patient to them is primarily an opportunity for concrete evidence of their progress or for theoretical experimentation. They know of course that a patient is sometimes also a source of revenue, but that is of the least importance. Their dental intellect is developed to the  $n$ th degree, leaving no

room for the other faculties which one must possess in order to be a successful dentist.

For example, any operation, either preventive or restorative, must be performed in such a manner as to meet their supercritical concept of perfection. They spend hours staining and blending a porcelain jacket until it harmonizes perfectly in shade and hue with the rest of the teeth in the patient's mouth; they cast and recast, make and remake, polish and repolish, regardless of the ability or inability of the patient to pay for such extraordinarily skillful and painstaking service. They give no thought to the time element, cost of material or general overhead expense entailed. Their entire attention is focused on turning out a piece of work that is to surpass all their previous efforts.

This of course is as it should be and perfectly proper, provided they display equal skill in getting paid for their work as they do in performing it. These two faculties are not always equally balanced, to which their creditors will readily testify.

Equally unbalanced is the dentist whose emotional faculty is overdeveloped. This is the soft-hearted, altruistic, humanitarian individual who readily believes that most of the

patients coming to his office are objects of charity, and that as a professional healer he is morally bound to work for them for nothing or next to it. If a patient complains that the estimate given is more than he can afford, he immediately reduces it to half. If any unpaid balance remains outstanding for some time, he readily decides that there is no use in annoying the poor fellow any longer. "He has no money." It is true that his patients like him for an easy-going, good-natured fellow, but his wife and other dependents have a different story to tell. What good-will he gains from his patients as the result of his overdeveloped emotional responses is at the expense of his own as well as his dependents' comfort and happiness.

Unfortunately, we have in the dental ranks the purely volitional individual also—the high-pressure doer who surrounds himself with a type of practice based on the law of average, that is, a practice in which the more patients he whisks in and out of the chair, the more two-dollar bills he has in his pocket at the end of the day. The human element plays no part in his office, as emotionally he is a dwarf, and his technic fares no better, for his dental intellect is no bigger than the size of a shriveled pea. His concept of success is based exclusively on the size of his bank balance.

It is safe to assume that none of these three types of dentists is truly happy, for they have not learned how to adapt themselves to their environments. Freud, Adler, Watson, James, and many other well-known psychologists advance the theory that all of our many forms of behavior are merely our

effort to adapt ourselves to our environment, since in doing so we can find perfect security, a sort of defense mechanism against the unpleasantness that is the lot of the introvert and unsocial being.

We are living in a system of society wherein our behavior is merely a response to outer stimuli produced either by tradition or by newer established precedents. We arise in the morning at a certain time, not necessarily because we have had sufficient sleep and are fully rested but because as cogs in community life we must be at our post at a certain definite time. We partake of our luncheon at the noon hour, not necessarily because we are hungry just then but because that particular hour has been set aside for that purpose. The food we eat, the clothes we wear, the houses we live in, the recreation we partake of—in fact, everything that we do during our waking hours—are not necessarily the things we like to do best, but because as a natural rule of our present scheme of things they are ordained in accordance with the share of our contribution toward the general well-being of civilized society.

This of course may sound paradoxical, for one may reason that the purely volitional dentist contributes little or nothing to society and gets a good deal out of it. True, but the things that he gets are purely material, which are seldom, if ever, any contribution toward one's happiness. There have been many wealthy people with all the material goods of the world at their disposal who were not happy. On the other hand, many paupers have manifested extreme happiness. The

purely volitional dentist or, to give him the proper appellation, the advertising dentist is not a class-conscious being nor even a social being. All his former classmates and all decent practitioners shun his company. He is barred from dental societies; he is an outcast in professional life. He may have a good many of the material things, but not happiness, for he is anarchistic and at variance with his environment.

In all walks of life and in all human endeavors we find the same condition existing. One may write a good book, a book that would really be a boon to mankind, but, as long as it remains in its original manuscript in the drawer of the author's desk, it serves no purpose either to him or to the public. Only after the book goes through the proper channels does it commence to function. Coal in the mine warms no human body; pearls at the bottom of the sea adorn no woman's throat. The great talents of a Galli Curci, an Elman or a Heifetz probably never would bring the joy that they now do if they had not placed themselves at the disposal of experienced managers who know all the intricacies of our present complex system of society.

Dentistry is no exception. If dentistry is to function both for the practitioner and for the public, it must coincide harmoniously with the present scheme of things and maintain an even balance of the three faculties mentioned. A dentist may be particularly painstaking about turning out a piece of work that must be perfect in every detail, but he must coincide with the present scheme of life and also insist

on getting a fee commensurate with the service that he renders. A dentist may be so fond of humanity that his well of sympathy will overflow with every sad story related by his patients, but he must not (to use an often repeated expression) allow his heart to run away with his head. He must not forget to reserve some of that sympathy for those at home, and, incidentally, also for the old man who will be dependent upon him some day.

Max Mueller tells of a parable which he learned from the lore of the East of how the gods, having stolen from man his divinity, met to discuss where they should hide it. One suggested that it be carried to the ends of the earth and buried, but it was pointed out that man was a nomadic creature, and that in his wanderings he might come upon the lost treasure. Another proposed that it be dropped into the depths of the sea, but the fear was expressed that man with his insatiable curiosity might find it even there. Finally, after much thought, the oldest and wisest of the gods said, "Hide man's divinity in his own heart. That will be the last place he will ever look for it." Ever since then man has been looking for his divinity in all places except within himself.

The dentist in his weakness is looking for strength in all outside sources. The solution to the economic problem does not lie in special schemes, plans, or elaborate bookkeeping systems; it lies within his own self. He is the maker of his own economic problem. He can also solve it.

220 West 42nd Street

# PRACTICAL HINTS

THIS DEPARTMENT IS NOW BEING CONDUCTED FROM THE OFFICE OF THE DENTAL DIGEST. TO AVOID UNNECESSARY DELAYS, HINTS, QUESTIONS AND ANSWERS SHOULD BE ADDRESSED TO EDITOR PRACTICAL HINTS, THE DENTAL DIGEST, 220 WEST 42D STREET, NEW YORK, N. Y.

NOTE—Mention of proprietary articles by name in the text pages of THE DENTAL DIGEST is contrary to the policy of the magazine. Contributions containing names of proprietary articles will be altered in accordance with this rule.

## *Editor, Practical Hints:*

In Practical Hints for November, H. M. F. details a method of removing shell crowns by boring a hole on the buccal, burring out the cement over the occlusal surface of the stump, inserting an old excavator shank, using the stump as a fulcrum and prying or levering off the crown.

During the past thirty years this method of crown removal has been described by various writers. It is a good method and ordinarily successful, but should be used with discretion. It may result in disaster.

After using it successfully a number of times, I attempted to remove a crown from a rather long slender upper bicuspid. I removed the crown all right, but the crown of the tooth came with it. It fractured at the gum line. To say that it was difficult to explain to the patient is putting it mildly. Soon afterward I began to read similar experiences of others.

If the tooth is short, vital and not greatly weakened by decay, this method is safe and efficient. Bridge abutments are a better risk than single crowns.

If the tooth is devitalized, it is safer and usually quicker to grind a slot from

the gingival to the occlusal margin with a knife-edged stone and with a thin-bladed burnisher pry the edges of the slot open and away from the tooth. Then bur out the occlusal cement and lever it off, as H. M. F. describes. Nor is it difficult to repair such a crown. Replace it on the tooth and burnish the edges to place. Cut a strip of 24K gold plate, 34 gauge, about 2 mm. wide and long enough to cover the slot and a little more. Swage to place with a pellet of wet cotton. Remove it and lay it on a charcoal block. Sweat a little 18K solder the entire length.

With a garnet disk, freshen the crown surface that is to take the solder. Apply a little paste flux and position the patch. It is not necessary to invest it. Lay it on a charcoal block and heat carefully with a small, pointed, soft, blowpipe flame, one with a little yellow in the tip, until the patch settles to place, showing solder at the edges. If it shifts a little, reheat and tease it to place with an old excavator point.

And, last but not least, do not attempt to remove a crown or bridge, not your own work, without stating to the patient that it may result in the destruction of the restoration and pos-



sibly in the loss of the tooth. This statement should be made in the presence of a witness. If the patient will not accept the liability, do not carry it yourself. Let some one who is looking for trouble do it.

L. S. BUGBEE.

*Editor, Practical Hints:*

I have read the case presented by A. J. P. and wish to express my views.

He states, "We know that the patient has a deficiency of calcium." As the writer sees it, if he knows of a calcium deficiency, then put the patient on an intensive calcium and phosphorus diet.

According to Sherman L. Davis, Ph.D., "the daily physiological requirement for an adult of average size is about fifteen (15) grains of calcium and twenty-two (22) grains of phosphorus."

So, if A. J. P. will check up on what his patient is eating, he may find that she is not getting the proper amount of these minerals. It would be necessary not only to have the amounts above but also to double those amounts for sixty to ninety days and watch the result. The writer believes that he will see a great change.

The diet should be very heavy with Vitamin D, which is found in butter (when the cows are eating green grasses) and green vegetables, cabbage, lettuce, carrots, tomatoes, also fruit juices, oranges, peaches in season. Do not forget cow's milk, at least a quart per day.

The following are a few foods and their mineral contents:

	Calcium units	Phosphorus units	Iron units
Oranges			
1 medium .....	9	2	2
Figs			
2 to 3 .....	7	3	6
Pineapples (fresh)			
¾ cup .....	4	4	6
Rhubarb			
½ to 2/3 cup .....	7	3	7
Cabbage			
½ to 2/3 cup .....	5	2	6
Carrots			
Medium large, raw ..	9	4	4
Spinach			
½ to 2/3 cup .....	10	5	25
Lettuce			
¼ solid head .....	5	3	8
Beans (dried)			
½ cup .....	7	10	14
Shredded wheat			
1 .....	8	1	8
Butter			
1 cup .....	40	19	4
Cheese			
1 inch cube .....	30	12	2
Cream 18%			
1 cup .....	34	16	3
Milk (whole)			
1 quart .....	160	68	16
Molasses			
2 tablespoonfuls ...	10	1	17

To add to this, it would be well to give the patient a teaspoonful of Super D Cod-Liver Oil per day for the sixty- or ninety-day period.

I hope that the above may be of some help to A. J. P. if he wishes to follow my suggestion, and I should like to have a report on the results of the case if he does use it.

J. FINDLEY SMARTT.

*Editor, Practical Hints:*

In the December issue of THE DENTAL DIGEST, L. D. K. inquires concerning the cause of "creaking" after the insertion of a large D. O. amalgam filling. Within the past year I had a similar experience and finally located it in too wide a contact point with an adjacent amalgam filling. When this was polished to the correct size and the

two teeth allowed to resume their individual movements, the "creak" disappeared.

In closing, I wish to pay tribute to the great value of your section of THE DENTAL DIGEST.

G. F. ROULSTON.

*Editor, Practical Hints:*

I desire to advise L. D. K. that if he will polish his amalgam filling distally and also polish the old amalgam filling, which is in the mesial surface of the second molar, all sound will disappear.

CECIL P. BROWN.

*Editor, Practical Hints:*

I have a patient, a boy, 12 years of age. The maxillary central incisors and first molars are fully erupted and normal, the deciduous cuspids and laterals are still in place, the laterals decayed to the gum line. The x-ray discloses the two permanent cuspids in process of eruption just distal to the deciduous cuspids, with only slight absorption on the side of the deciduous cuspid on the right side and no absorption on the left. The two permanent laterals and the four bicuspid are missing. Would you advise the extraction of the deciduous teeth at once to permit more normal eruption of the cuspids, and, if so, what would you advise in regard to restoring the lost members, and when?

In the mandible of the same boy the four incisors and first permanent molars are in place, also the two deciduous cuspids. The x-ray shows the permanent cuspids and bicuspid in process of eruption. The second bicuspid seem to be impacted under the

first permanent molars, the left one much more so than the right. What procedure would you advise in this case?

A. M.

ANSWER.—The problem you present is not easy of solution. There is no doubt that the upper temporary laterals and cuspids should be extracted, and the temporary cuspids in the lower also should be removed. The seeming impactions of the lower bicuspid may be due to the angle at which the x-rays were taken.

Considering the age of the patient, it would be impracticable at the present time to supply the missing teeth in the maxilla by bridges or by a partial denture. However, the space can be maintained by banding the teeth and using a lingual or labial arch wire. The case should be kept under constant observation, and the eruption of the lower teeth should be checked by x-rays.

*Editor, Practical Hints:*

I have a patient who has an extremely sensitive palate. He gags from the slightest cause. He is to have an upper plate made soon and I should appreciate any suggestion that would be of help. I wondered if it would be advantageous to use a local anesthetic while taking the impression.

C. W. W.

ANSWER.—It is doubtful whether or not an injection would be of material aid in taking an impression. Sometimes swabbing the palate with an anesthetic solution is of assistance, but you are still confronted with the fact that the patient must wear the denture.

In many cases the gagging can be overcome by the patient, and an aid to this is forced breathing through the nose. The patient should be given to understand that his ability to wear a denture depends upon the overcoming of this difficulty. It may take several trials and a great deal of patience.

*Editor, Practical Hints:*

A mother complains that her three-year-old child, a girl, craves paper, sticks, pencils, dirt, and almost everything she can get hold of. She eats the edges of books and magazines. She eats also all kinds of food and plenty of it, milk especially, at mealtime. Can you suggest anything to break up this habit?

B. H. L.

ANSWER.—The child should be placed in the care of a physician. The symptoms may be caused by a nervous disorder or by intestinal parasites.

*Editor, Practical Hints:*

I gave a mandibular injection for the extraction of a second molar. The tooth was devitalized and much broken down; there was no pain before I extracted it and no inflammation, but I had to extract it because I could not use it as an abutment for the construction of a fixed bridge. I had only a partial anesthesia, so that in order to prevent a painful extraction I used, in addition, a pericemental injection, i.e., between the tooth and the process under pressure. I experienced a little difficulty in extracting it.

The patient failed to return for a

week, after which she reported with slight trismus, a certain difficulty in swallowing, and swollen, indurated, painful glands under the mandible.

Kindly tell me how you would treat this case.

T. M. T.

ANSWER.—There is evidently an infection present and, if pus has formed, it should be opened up. Otherwise massage and the use of a hot mouthwash, preferably of magnesium sulphate, will be of value. The mouth should be opened wider and wider but very gradually, so that the muscles will not be suddenly irritated.

*Editor, Practical Hints:*


Recently I have observed several children with the frenum of the upper lip extending to the incisive papilla, causing separation of the temporary central incisors.

In one case the incisive papilla is located directly between the temporary centrals, causing considerable separation.


In such cases should the frenum be clipped and the papilla removed, or will the condition of separation that exists correct itself when the permanent incisors erupt? In such cases, what would you suggest?

G. F. K.

ANSWER.—As a rule, it is necessary to cut the frenum and remove the fibrous tissue, though the papilla should be left alone. If the frenum is permitted to remain, the permanent teeth will be separated also.



## CORRESPONDENCE



### A Warning

*Editor, THE DENTAL DIGEST:*

I should like to warn my fellow dentists throughout the country of a magazine solicitor who is traveling through the different states representing himself as a sales manager of the "Three Pay Sales Corporation," 1440 Broadway, New York, N. Y., whereas he has nothing to do with that corporation, and as he has cashed checks made out to the above-mentioned corporation he is wanted by the police in many cities. So, if they would notify the police, they would be doing a very justifiable act.

He is a man of about medium height, weighs about 160 pounds, has dark hair, brown eyes, upper central incisors slightly spaced, and seems to prey on the dental and medical professions. He has been very active in the Southern States for the past several months.

Hoping that you may be able to warn the members of the profession, I remain

Very sincerely yours,

(Signed) DR. J. A. O'NEIL,

Harvey Bldg.,  
West Palm Beach, Fla.



# DENTAL SECRETARIES and ASSISTANTS

## Secretaries' Questionnaire

All communications should be addressed to Elsie Pierce, care of  
THE DENTAL DIGEST, 220 West 42d Street, New York, N. Y.

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NOTE—HAVE YOU A BETTER WAY? HAVE YOU A TIME-SAVING SHORT CUT? DO YOU KNOW A "STUNT" THAT LIGHTENS THE WORK OR MAKES FOR GREATER EFFICIENCY IN THE OFFICE? IF SO, WRITE TO ELSIE PIERCE. YOU MAY HELP MANY GIRLS WHO ARE BEGINNERS—AND YOU KNOW HOW YOU NEEDED HELP DURING YOUR FIRST FEW MONTHS IN A DENTAL OFFICE. PERHAPS YOU NEED HELP NOW. WRITE TO ELSIE PIERCE—SHE WILL HELP YOU.

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*Dear Miss Pierce:*

To help out the inquirer from Nebraska, I. L. M., on the hard water question—have her try common hydrochloric acid on the bowls, and even on nickel plating, using a very stiff brush or a cloth fastened to a stick as a swab. This will also remove silver nitrate stains from the bowls; at least, it does with our hard water from the Missouri River here in Bismarck.

Dr. C. C. H., North Dakota

*Dear Miss Pierce:*

I notice that a few of your readers are having some difficulty with lime in the cuspidor and in an aluminum pan. I have been in practice for nearly thirty-two years in small towns and have had to work out my own salvation. I would suggest to I. L. M. of Nebraska that she use hydrochloric acid or, as it is sometimes called, muriatic acid, taking a swab of cotton and rubbing the stain in the cuspidor. Calcium chlorid will result, which is extremely soluble and

will wash away when the cuspid is flushed.

For O. M. B., Conn.—fill the aluminum pan with water, add two or three tablespoonsful of nitric acid (C. P.), and leave overnight. This acid has little or no effect on aluminum, but be careful not to get any on the fingers, as it leaves a yellow stain that will not wash off.

You are at liberty to pass these suggestions on and, if good results are obtained, I shall feel repaid for my trouble.

Dr. H. M. K., Canada

The department is deeply indebted to these members of the dental profession who have so kindly come to the aid of some of our readers. I am sure their suggestions will prove of great value to all our readers, and we thank them most sincerely for their interest.

*Dear Miss Pierce:*

The water in our city is very hard and

in the bottom of the sterilizer it leaves a hard crust like that in a tea kettle. I use a teaspoon of vaseline about twice a week, and it keeps the rest of the boiler in good condition. This crust seems to form especially on the rivets of the boiler. I have to scrape it off with an instrument and of course in doing so scratch the surface.

I should appreciate very much if you or some reader could help me with this problem. I have gotten many practical hints from your column.

H. C., South Dakota

ANSWER.—This is answered in the two foregoing suggestions, which, we hope, solve your problem.

*Dear Miss Pierce:*

I read with interest the Questionnaire each month, and I find it very helpful.

Some one wanted to know what would remove the water stains from the cuspidor. I have tried the solution of oxalic acid, also the borax water, but the best that I have found so far is steel wool, which with little trouble will remove the stains almost instantly.

I also want a little advice. What is the best way to clean impression trays? I surely shall appreciate the answer.

E. M. P., Mississippi

ANSWER.—We have in past issues given several methods for the cleansing of impression trays, which we are glad to repeat for E. M. P. and other readers who may be interested. Coat the trays with vaseline, nujol, or any other vegetable oil; heat over a flame and wipe clean with a cloth. Repeat the process if necessary. Then polish with

pumice, using a moderately stiff brush on the lathe, or use steel wool.

Trays can also be boiled with soap powder until clean, then polished as directed.

*Dear Miss Pierce:*

I have been reading your articles, and I find them very interesting. I tried the solution of F. L. of New York, but it did not succeed in my case. There are some stubborn stains on the mahogany unit from iodine, which have been on for several weeks. I have tried nearly everything to remove them. Can you help me on this? I should greatly appreciate it.

I have a solution for removing fresh red copper cement from instruments and slabs. Take a tablespoonful of bicarbonate of soda in a small glass of water. This will remove any kind of cement as well. R. M., New Jersey

ANSWER.—If the iodine stains have not been helped the x-ray developing solution or by touching them with ammonia and immediately removing with a cloth, I fear that to use stronger agents would mar the unit. I suggest that you write to the manufacturers of the equipment. They will know of what the finish on the unit is composed, and their chemist may be able to advise you with better results.

We thank you for the suggestion for the removal of cements from instruments and slabs. May we add this idea—keep a salt shaker filled with bicarbonate of soda on the wash-basin shelf, moisten the slabs and instruments and sprinkle generously with the soda. When you are ready to "clean up," the cement will come right off.



## Educational and Efficiency Society for Dental Assistants, First District, New York, Inc.

The Educational and Efficiency Society for Dental Assistants, First District, New York, Inc., observed its eighth birthday on December 10, 1929, with an excellent program of speakers, including Dr. C. H. Schott of Cincinnati, Dr. W. M. Dailey of New York, Juliette A. Southard, Founder of the Society and President of the American Dental Assistants Association, and Alice Cary Russell, a noted club-woman.

Dr. Dailey was the guest of honor and speaker of the evening, taking as his topic *Service*. He expressed the opinion that the dental assistant is a necessity in the proper conduct of a dental office, and that the Society in its educational work is the nucleus of a new profession.

The Society has a splendid record of achievement in its efforts toward higher standards of education and professional recognition for the dental assistant. In all activities the organization strives to enlarge the knowledge of its members in matters pertaining to their duties in the dental office and to teach them an appreciation of the ideals and aims of the dental profession in its service to the laity. Regular meetings are held each month for a program of lectures by members of the dental and medical professions and by well-informed club-women, who bring facts and inspiration from other spheres of women's activities.

Classes are an important phase of the Society's work and are held one evening

each week under the direction of competent instructors. To date classes on dental anatomy and x-ray technic have been successfully completed and a class on diet is to begin shortly. Additional groups are being formed to study other subjects of equal value to the assistant. The Secretary of Classes may be addressed: Mary A. O'Connor, c/o Dr. Reiner, Cliffside, N. J.

At the regular meeting of the Clinic Club on December 20, 1929, a most interesting and instructive lecture-clinic was presented by Dr. B. E. Beck. Each step in the making of the gold inlay, by the direct and the indirect methods, was described and carried through, including the casting. At the January meeting a lecture on filling materials was given. The Club meets regularly on the third Monday of each month, September to May, inclusive, when the various phases of dental assisting are studied. All members of the Educational and Efficiency Society are eligible for membership and are urged to participate in the activities of the Club. The next meeting will be held at the office of Dr. S. R. Eolis, 1475 Broadway, New York, on February 17, 1930, at 7.45 P. M. Further information may be obtained from the Secretary, Gertrude Gehm, 921 Bergen Ave., Jersey City, N. J.

The Society owns a library of articles on subjects of importance to dental assisting, books, and a collection of historical pictures and facts relating to dentistry. The contents of the Library

are available to members and may be had by communicating with the Librarian, Mollie Friedland, 1466 St. Marks Ave., Brooklyn, N. Y.

Meetings of the Society are held regularly on the second Tuesday evening of each month, October to May, inclusive, at the Academy of Medicine, 2 East 103rd Street, New York. Dental assistants employed in ethical dental

offices are eligible for membership and are welcome at the meetings. The next meeting will take place on Tuesday, February 11, 1930, at 8.00 P. M. The speaker will be Dr. C. M. McNeely, President of the Second District Dental Society, New York. A cordial invitation to be present is extended to the members of the dental profession and to their assistants.

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### Montreal Dental Assistants Association

The Montreal Dental Assistants Association held its study class and business meeting at the McGill Dental Faculty on December 16, 1929, with

Miss E. Moye, President, in the chair. A large number of dental assistants joined the study class, which is being held semi-monthly.



# EXTRACTIONS

No Literature can have a long continuance if not diversified with humor—ADDISON

While prohibition is reigning, rum is pouring.

The logical way to achieve disarmament is to build battleships by public subscription.

It is said that Henry Ford has added a red flannel shirt to his collection of Americana.

(Tom)—You've heard of Naples, the famous Italian port, haven't you?

(Jerry)—No; how much is it a bottle?

(Teacher)—Mary, why doesn't the lamb follow you to school nowadays?

(Mary)—What, with me driving forty miles an hour!

Women are going to wear their clothes longer, and, after what has happened in Wall Street, men are too.

(Customer)—Have you any good pork today?

(Butcher)—Good pork! Say, I've got some pork that will make better chicken salad than any lamb you can buy!

Sing a song of ashcans,  
People going by,  
Four-and-twenty cinders  
In everybody's eye.  
When the cans are emptied,  
The ashes cloud the scene.  
Isn't that a dirty way  
To make a city clean!

"What did your wife say when you drove past the traffic cop?"

"Nothing," said Mr. Chuggins. "The occasion was one of those valued incidents in life when Henrietta permits me to do most of the talking."

## GAMBLING IN LONDON

All Scotty possessed was a penny and a gigantic thirst. He entered a pub, and saw a man who had just ordered a drink.

"I bet you a penny I can drink that without you seeing me," said Scotty.

"It's a bet," said the man.

The Scotchman drained the glass.

"But I saw you drink it," the man protested.

"All right, you win," said Scotty, as he made a bee line for the door!

When drinking cocktail at your host's home, you should be careful not to spill any on the floor as you might burn holes in the carpet.

Now the hand that rocks the cradle also flicks the cigarette ashes.

Stocks are going up. Stocks are coming down. Now don't say we didn't tell you.

There is a movement on foot to supplant the old-fashioned Pullman waiters with chic and pretty waitresses. You see, when the train lurches going around a curve, some of the patrons would prefer to find something in their laps more attractive than a plate of soup.

The doctor told him to take a pickle just before going to bed if he could keep it on his stomach. Next day he told the doctor it rolled off when he turned over.

(Broker)—Say, do you know that fellow Winkle is a hummer. I'm told that he is pulling off big things in Wall Street notwithstanding the market flops.

(Banker)—Well, I know all about him better than you do. The biggest thing he ever pulled off was his shirt.

An American was prowling around a Scottish churchyard. His eyes caught an epitaph, "Lord, she was thin."

"Say, sexton, what d'ye make of that?" he asked.

"That's a' richt, sir; the sculptor went over near the edge of the stone and didna leave room for the 'e'."

An explorer confesses to an error of 85,000,000 years in estimating the age of the dinosaur eggs he found last summer. He should be more careful. 85,000,000 years makes some difference between "fresh" and "strictly fresh" eggs.

(Sam)—Did you hear about the detectives grabbing old Jiggs disguised in woman's clothes?

(Jack)—How did they suspect him of being a man?

(Sam)—He walked past a milliner's window without looking in.

A constant drop of water

Wears away the hardest stone,

The constant gnawing Fido

Masticates the toughest bone.

The constant wooing lover

Carries off the blushing maid,

And the constant advertiser

Is the one that gets the trade.

# FUTURE EVENTS

## EASTERN DENTAL SOCIETY OF NEW YORK

### SCIENTIFIC SESSION

Thursday Evening, February 6, 1930

Meets the first Thursday of each month from October, 1929 to May, 1930.

Meeting Place: 425 Lafayette Street, New York.

Essayist: Aaron Goldman, D.D.S.

Subject: *Oral Surgery and Exodontia in Daily Practice* (illustrated with lantern slides).

Round Table Discussions (In Amphitheatre): 8:15 P. M. Sharp.

Subject: *Oral Surgery and Exodontia*.

Leader: Leo Winter, D.D.S.

A series of clinics, covering the subject of *Oral Surgery and Exodontia* in detail, will begin at 7:30 P. M.

### CLINICIANS

Herman Ausubel,  
Samuel Birenbach,  
M. S. Calman,  
M. Hillel Feldman,  
Robert Friedman,  
S. Berton Gerstner,  
William Greenberger,

Leon Harris,  
A. Kuntz,  
Julius Pensak,  
John Jacob Posner,  
Herman I. Reiss,  
Samuel I. Sherman,  
Armin Wald.

**THE BALTIMORE CITY DENTAL SOCIETY** will hold its fifth annual Mid-Winter Clinic on February 7-8, 1930, at the Lord Baltimore Hotel.

U. G. Rickert of Ann Arbor, Michigan, will give a clinic and discussion on *Oral Diagnosis*; Dayton D. Campbell of Kansas City, Mo., a clinic on *Full Dentures*; Frank R. Kent of Boston, Mass., a lecture and demonstration on *Dental Economics*; and Albert J. Irving of New York a clinic on *Gold Inlay Technic*, paying particular attention to the sliced cavity preparation.

The number who may subscribe to the clinic is limited to two hundred, and applications are accepted in the order in which they are received until the quota has been filled.

HARRY B. MCCARTHY, *Chairman*,  
815 Medical Arts Bldg.,  
Baltimore, Md.

**THE DALLAS MID-WINTER DENTAL CLINIC** will be held in Dallas, Texas, February 10-12, 1930.

Clinicians: George M. Hollenback of Los Angeles, crown and bridge; R. O. Schlosser of Chicago, prosthetics; Thomas P. Hinman of Atlanta, surgery; W. J. Charters of Des Moines, periodontia.

BROOKS BELL, JR., D.D.S., *Sec'y*,  
1810 Medical Arts Bldg.,  
Dallas, Texas.

**THE WESTCHESTER DENTAL SOCIETY** will hold its monthly scientific session on Tuesday evening, February 18, 1930, at the Community Center, 122 South Broadway, Yonkers, N. Y.

Dr. Edward Thompson of New York will discuss *Essentials of Full Denture Construction*.

The attendance of every interested practitioner is solicited.

**THE KINGS COUNTY DENTAL SOCIETY** will hold its Mid-Year Meeting for Progressive Dentistry at the Brooklyn Elks Club, Livingston Street and Boerum Place, Brooklyn, N. Y., February 19-22, 1930.

On Thursday, February 20th, at 8:30 P. M., William E. Cummer, D.D.S., Professor of Prosthetics and Department of Technology, University of Toronto, will lecture on *Partial Denture Service—A Bio-Engineering Problem*. The discussion will be opened by Lee Walter Doxtater, D.D.S., Clinical Professor of Prosthesis, College of Dentistry, New York University.

At 2:00 P. M. of the same day Dr. Cummer will conduct a table clinic on *A Proposed Impression (Primo-Secondary) Technic for Mucosa and for Tooth-Mucosa Supported Partial Dentures* (approaching as nearly as possible full denture impression technic).

Other clinicians will be: Francis Scott Weir, Simon Shapiro, Henry Wasserman, Fred Adams, Adolph Berger, James K. Burgess, Clyde Schuyler, Theodore Blum, Victor Hugo Sears, L. I. Abelson, A. L. Greenfield, S. Both, John T. Hanks, H. Pratt, M. Strausberg and S. Wolfson.

Topic Discussions: L. W. Dunham, *Dental Economics*; J. P. Ruyl, *Full Denture Service*; A. Walker, *Operative Dentistry*; M. I. Schamberg, *Oral Surgery*; John Oppie McCall, *Periodontia*.

There will be a manufacturers' exhibit in the main ballroom.

Registration to attend the clinics must be made in advance. Admission cards for lectures and clinics may be obtained from the Secretary, 62 Hanson Place, Brooklyn.

The four days' meeting will terminate on Saturday evening, February 22nd, with a banquet and dance in the Elks grand ballroom. Tickets may be obtained from J. L. Felsenfeld, 133 South 9th Street, Brooklyn, N. Y.

THE MINNESOTA STATE DENTAL ASSOCIATION will hold its forty-seventh annual meeting in the Auditorium, Minneapolis, Minn., February 26-28, 1930. A cordial invitation to attend is extended to all members of the American Dental Association.

GEO. D. ESTES, *Secretary*,  
911 Medical Arts Bldg.,  
Minneapolis, Minn.

THE CENTRAL PENNSYLVANIA DENTAL SOCIETY will hold its twenty-eighth annual meeting in Altoona, Pa., February 26-28, 1930, at the Penn Alto Hotel.

R. L. McKIM, *President*,  
Osceola Mills, Pa.  
J. G. SHAFFER, *Chairman*,  
Local Arrangements Committee,  
1200 14th Ave., Altoona, Pa.

THE DENTAL ALUMNI ASSOCIATION OF THE COLLEGE OF PHYSICIANS AND SURGEONS OF SAN FRANCISCO, SCHOOL OF DENTISTRY, will hold its annual meeting at the College, March 7-8, 1930.

Preceding the general sessions there will be eight special courses. Information regarding these will be mailed on request.

A cordial invitation to attend is extended to the entire ethical dental profession.

DON J. AUBERTINE, *Chairman Publicity Committee*,  
291 Geary St., San Francisco, Calif.

THE REHWINKEL DENTAL SOCIETY will hold its annual mid-winter meeting at Highlands Community Restaurant, Chillicothe, Ohio, in the Blue and Gold Room, on Saturday, March 22, 1930.

George B. Winter, D.D.S., of St. Louis, and I. Lester Furnas, D.D.S., of Cleveland, will be among the essayists and clinicians who will participate in the program. The latest and most approved appliances will be on exhibit.

All ethical dentists are cordially invited.

W. G. HAMM, D.D.S., *Sec'y-Treas.*

THE AMERICAN SOCIETY OF ORTHODONTISTS will hold its twenty-ninth annual meeting at the Noel Hotel, Nashville, Tennessee, April 8-11, 1930.

An attractive program by outstanding essayists and clinicians is being arranged, and this meeting should be one of extreme interest to every member of the Society.

A cordial invitation is extended to all ethical dentists who are interested in orthodontia.

O. A. OLIVER, *President*,  
Nashville, Tenn.  
CHARLES R. BAKER, *Sec'y-Treas.*,  
Evanston, Ill.

THE CONNECTICUT STATE DENTAL ASSOCIATION will hold its annual meeting at Stamford, Conn., April 22-24, 1930.

THE CONNECTICUT DENTAL HYGIENISTS' ASSOCIATION will hold its annual meeting at the Stamford High School, Stamford, Conn., April 23-24, 1930.

EVELYN J. MAHER, *Secretary*.

THE AMERICAN SOCIETY OF STOMATOLOGISTS will hold its seventh meeting at the Hotel McAlpin, New York, N. Y., May 2, 1930. A cordial invitation to attend this meeting is extended to all dental practitioners and general physicians. Members and non-members who wish to take part on the program may communicate with Dr. King S. Perry, Jeannette, Pa.

THE MASSACHUSETTS DENTAL SOCIETY will hold its annual meeting at the Copley-Plaza Hotel, Boston, Mass., May 5-9, 1930.

THOMAS K. ROSS, *President*,  
280 Main St., Fitchburg, Mass.

PHILIP E. ADAMS, *Secretary*,  
236 Newbury St., Boston, Mass.

THE VIRGINIA STATE DENTAL ASSOCIATION will hold its next meeting in Richmond, Va., May 12-14, 1930.

THE DENTAL SOCIETY OF THE STATE OF NEW YORK will hold its sixty-second annual meeting at the Hotel Commodore, New York, May 12-16, 1930.

Dr. Thomas C. Swift, 1 Park Avenue, Mt. Vernon, N. Y., is Chairman of the Exhibit Committee; Dr. Harvey J. Burkhart, 800 East Main Street, Rochester, N. Y., is Chairman of the Program Committee; and Dr. J. W. Schelpert, 30 Cottage Avenue, Mt. Vernon, N. Y., is Chairman of the Clinic Committee. Any information regarding these departments should

be addressed directly to the chairmen of the committees.

The first two days of the meeting will be devoted to educational clinics, and the following subjects will be covered by the teachers designated:

*Root Canal Therapy*, Guy P. Bannister, Cleveland, Ohio; Arthur B. Crane, Washington, D. C.

*Operative Dentistry (Inlay)*, W. Elliott Taylor, Frank Cole; Herbert S. Bailey, New York, N. Y.

*Operative Dentistry (Amalgam)*, William R. Pond, Rutland, Vt.

*Operative Dentistry (Gold Foil)*, LeRoy L. Hartman, New York, N. Y.

*Ceramics*, William J. Meier, H. S. Both, New York, N. Y.

*Removable Bridgework*, S. Marshall Weaver, Cleveland, Ohio; Milton Cohen, New York, N. Y.

*Fixed Bridgework*, James K. Burgess, New York, N. Y.; Emory C. Thompson, Buffalo, N. Y.

*Clasp Attachments for Partial Dentures and Removable Bridgework*, Forry R. Getz, Lee G. Pollock, New York, N. Y.

*Partial Denture Construction*, Geo. P. Phillips, Boston, Mass.; Clyde H. Schuyler, New York, N. Y.

*Full Denture Construction*, Arthur T. Rowe, New York, N. Y.; Frank A. Fox, Philadelphia, Pa.

*Dietetics*, Sherman L. Davis, Indianapolis, Ind.  
*Diseases of the Mouth and Their Treatment*, J. L. Appleton, Jr.; James N. Aiguier, Philadelphia, Pa.

*Periodontia*, T. B. Hartzell, Minneapolis, Minn.; Harold J. Leonard, New York, N. Y.

*Orthodontia*, under direction of Joseph D. Eby, New York, N. Y.

*Radiography and Photography*, Ralph S. Voorhees, Rochester, N. Y.

*Oral Surgery*, Harold S. Vaughan, Henry S. Dunning, Adolph Berger, Leo Winter, Douglas B. Parker.

On the literary program there will be con-

tributions by George B. Winter, St. Louis; John V. Mershon, Philadelphia; Thomas B. Hartzell, Minneapolis; Sherman L. Davis, Indianapolis; J. L. Appleton, Jr., Philadelphia. There will be important reports from the Scientific Committee and also from the Bloomingdale Hospital of New York.

A banquet will be held on Thursday evening, May 15th.

There will be general clinics on Friday morning, May 16th.

During the time of the meeting, sessions of the New York State Dental Hygienists Association and of the Dental Assistants Association of the State of New York will be held.

The Executive Council will convene on Tuesday, May 13th, at 2:30 P. M.

WILLIAM C. FISHER, *President*,  
A. P. BURKHART, *Secretary*,  
57 East Genesee St., Auburn, N. Y.

THE TEXAS STATE DENTAL SOCIETY will hold its fifteenth annual convention at Fort Worth, Texas, May 20-23, 1930.

A cordial invitation to attend is extended to all dentists who are members of the American Dental Association.

For information relative to exhibits write to Dr. W. H. Nugent, Chairman, 713 Medical Arts Bldg., Fort Worth, Texas.

GEORGE H. MENGEL, *President*,  
El Paso, Texas.  
J. G. FIFE, *Sec'y.-Treas.*,  
Dallas, Texas.

THE AMERICAN DENTAL HYGIENISTS ASSOCIATION will hold its seventh annual meeting in Denver, Colorado, July 21-25, 1930.

AGNES G. MORRIS, *Secretary*,  
886 Main Street,  
Bridgeport, Conn.





